



STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER RESOURCES

William R. Snodgrass - Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor
Nashville, Tennessee 37243-1102

December 30, 2016

Mr. Steve Hill
City Manager
e-copy: steve.hill@crossvilletn.gov
City of Crossville
392 N. Main St
Crossville, TN 38555

Subject: **NPDES Permit No. TN0024996**
City of Crossville
Crossville, Cumberland County, Tennessee

Dear Mr. Hill:

In accordance with the provisions of the Tennessee Water Quality Control Act, Tennessee Code Annotated (T.C.A.), Sections 69-3-101 through 69-3-120, the Division of Water Resources hereby issues the enclosed NPDES Permit. The continuance and/or reissuance of this NPDES Permit is contingent upon your meeting the conditions and requirements as stated therein.

Please be advised that a petition for permit appeal may be filed, pursuant to T.C.A. Section 69-3-105, subsection (i), by the permit applicant or by any aggrieved person who participated in the public comment period or gave testimony at a formal public hearing whose appeal is based upon any of the issues that were provided to the commissioner in writing during the public comment period or in testimony at a formal public hearing on the permit application. Additionally, for those permits for which the department gives public notice of a draft permit, any permit applicant or aggrieved person may base a permit appeal on any material change to conditions in the final permit from those in the draft, unless the material change has been subject to additional opportunity for public comment. Any petition for permit appeal under this subsection (i) shall be filed with the Technical Secretary of the Water Quality, Oil and Gas Board within thirty (30) days after public notice of the commissioner's decision to issue or deny the permit. A copy of the filing should also be sent to TDEC's Office of General Counsel.

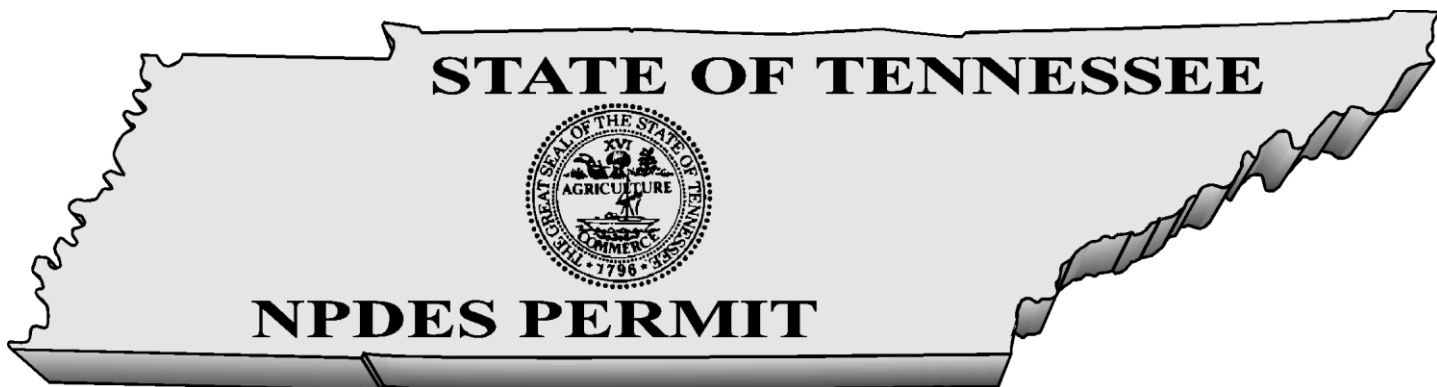
If you have questions, please contact the Cookeville Environmental Field Office at 1-888-891-TDEC; or, at this office, please contact Mr. Wade Murphy at (615) 532-0666 or by E-mail at Wade.Murphy@tn.gov.

Sincerely,

Vojin Janjic
Manager, Water-Based Systems

Enclosure

cc: Mr. Clark Annis, Wastewater Facilities Manager, clark.annis@veolia.com
Ms. Kim Hinch, Administrative Assistant, kimberly.hinch@veolia.com
Mr. Jim Hilborn, P. E., GRW Engineers, Inc., jhilborn@grwinc.com
NPDES Permit Section, EPA Region IV, r4npdespermits@epa.gov
Ms. Dana Wright, Tennessee Clean Water Network, dana@tcwn.org
Cookeville Environmental Field Office – DWR, jeff.patton@tn.gov, brian.mayo@tn.gov
Administrative File Record



No. TN0024996

Authorization to discharge under the
National Pollutant Discharge Elimination System (NPDES)

Issued By

**STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER RESOURCES
William R. Snodgrass - Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor
Nashville, Tennessee 37243-1102**

Under authority of the Tennessee Water Quality Control Act of 1977 (T.C.A. 69-3-101 et seq.) and the delegation of authority from the United States Environmental Protection Agency under the Federal Water Pollution Control Act, as amended by the Clean Water Act of 1977 (33 U.S.C. 1251, et seq.)

Discharger: **City of Crossville**
is authorized to discharge: **treated municipal wastewater from Outfall 001**
from a facility located: **in Crossville, Cumberland County, Tennessee**
to receiving waters named: **Obed River at mile 38.6**

in accordance with effluent limitations, monitoring requirements and other conditions set forth herein.

This permit shall become effective on: **February 01, 2017**

This permit shall expire on: **December 31, 2021**

Issuance date: **January 01, 2017**

A handwritten signature in blue ink, appearing to read "Tisha Calabrese Benton".

for Tisha Calabrese Benton
Director

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1.0. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1.1. NUMERIC AND NARRATIVE EFFLUENT LIMITATIONS

The City of Crossville is authorized to discharge treated municipal wastewater from Outfall 001 to the Obed River at mile 38.6. Discharge 001 consists of municipal wastewater from a treatment facility with a design capacity of 3.5 MGD. Discharge 001 shall be limited and monitored by the permittee as specified below:

Description : External Outfall, Number : 001, Monitoring : All Weather, Season : All Year							
Code	Parameter	Qualifier	Value	Unit	Sample Type	Frequency	Statistical Base
80998	Bypass of Treatment	Report	-	occur/mo	Occurrences	Continuous	Monthly Total
Description : External Outfall, Number : 001, Monitoring : Dry Weather, Season : All Year							
Code	Parameter	Qualifier	Value	Unit	Sample Type	Frequency	Statistical Base
74062	Overflow use, occurrences	Report	-	occur/mo	Occurrences	Continuous	Monthly Total
Description : External Outfall, Number : 001, Monitoring : Effluent Gross, Season : All Year							
Code	Parameter	Qualifier	Value	Unit	Sample Type	Frequency	Statistical Base
00300	Oxygen, dissolved (DO)	>=	5.0	mg/L	Grab	Five Per Week	Instantaneous Minimum
00400	pH	>=	6.0	SU	Grab	Five Per Week	Minimum
00400	pH	<=	9.0	SU	Grab	Five Per Week	Maximum
00530	Total Suspended Solids (TSS)	<=	30	mg/L	Composite	Three Per Week	Monthly Average
00530	Total Suspended Solids (TSS)	<=	876	lb/d	Composite	Three Per Week	Monthly Average
00530	Total Suspended Solids (TSS)	<=	40	mg/L	Composite	Three Per Week	Weekly Average
00530	Total Suspended Solids (TSS)	<=	1168	lb/d	Composite	Three Per Week	Weekly Average
00530	Total Suspended Solids (TSS)	<=	45	mg/L	Composite	Three Per Week	Daily Maximum
00545	Settleable Solids	<=	1.0	mL/L	Grab	Weekly	Daily Maximum
00600	Nitrogen, total (as N)	Report	-	mg/L	Composite	Weekly	Monthly Average
00600	Nitrogen, total (as N)	Report	-	lb/d	Composite	Weekly	Monthly Average
00600	Nitrogen, total (as N)	Report	-	mg/L	Composite	Weekly	Daily Maximum
00600	Nitrogen, total (as N)	Report	-	lb/d	Composite	Weekly	Daily Maximum
00600	Nitrogen, total (as N)	<=	431.7*	lb/d	Calculated-See Permit	Monthly	Annual Rolling Average Load
00600	Nitrogen, total (as N)	<=	76,169	lb/yr	Calculated-See Notes	Monthly	Annual Rolling Total Load
00665	Phosphorus, total (as P)	Report	-	mg/L	Composite	Weekly	Monthly Average
00665	Phosphorus, total (as P)	Report	-	lb/d	Composite	Weekly	Monthly Average
00665	Phosphorus, total (as P)	Report	-	mg/L	Composite	Weekly	Daily Maximum
00665	Phosphorus, total (as P)	Report	-	lb/d	Composite	Weekly	Daily Maximum

00665	Phosphorus, total (as P)	<=	47.7*	lb/d	Calculated-See Permit	Monthly	Annual Rolling Average Load
00665	Phosphorus, total (as P)	<=	8455	lb/yr	Calculated-See Notes	Monthly	Annual Rolling Total Load
50050	Flow	Report	-	Mgal/d	Continuous	Daily	Monthly Average
50050	Flow	Report	-	Mgal/d	Continuous	Daily	Daily Maximum
50060	Chlorine, total residual (TRC)	<=	.02	mg/L	Grab	Five Per Week	Daily Maximum
51040	E. coli	<=	126	#/100mL	Grab	Three Per Week	Monthly Geometric Mean
51040	E. coli	<=	941	#/100mL	Grab	Three Per Week	Daily Maximum
80082	CBOD, 5-day, 20 C	<=	10	mg/L	Composite	Weekly	Monthly Average
80082	CBOD, 5-day, 20 C	<=	292	lb/d	Composite	Weekly	Monthly Average
80082	CBOD, 5-day, 20 C	<=	15	mg/L	Composite	Weekly	Weekly Average
80082	CBOD, 5-day, 20 C	<=	438	lb/d	Composite	Weekly	Weekly Average
80082	CBOD, 5-day, 20 C	<=	20	mg/L	Composite	Weekly	Daily Maximum
TRP3B	IC25 Static Renewal 7 Day Chronic Ceriodaphnia	>	100	%	Composite	Annual	Minimum
TRP6C	IC25 Static Renewal 7 Day Chronic Pimephales	>	100	%	Composite	Annual	Minimum
Description : External Outfall, Number : 001, Monitoring : Effluent Gross, Season : Summer							
Code	Parameter	Qualifier	Value	Unit	Sample Type	Frequency	Statistical Base
00610	Nitrogen, Ammonia total (as N)	<=	1	mg/L	Composite	Weekly	Monthly Average
00610	Nitrogen, Ammonia total (as N)	<=	29.2	lb/d	Composite	Weekly	Monthly Average
00610	Nitrogen, Ammonia total (as N)	<=	1.5	mg/L	Composite	Weekly	Weekly Average
00610	Nitrogen, Ammonia total (as N)	<=	44	lb/d	Composite	Weekly	Weekly Average
00610	Nitrogen, Ammonia total (as N)	<=	2	mg/L	Composite	Weekly	Daily Maximum
Description : External Outfall, Number : 001, Monitoring : Effluent Gross, Season : Winter							
Code	Parameter	Qualifier	Value	Unit	Sample Type	Frequency	Statistical Base
00610	Nitrogen, Ammonia total (as N)	<=	1.75	mg/L	Composite	Weekly	Monthly Average
00610	Nitrogen, Ammonia total (as N)	<=	2.6	mg/L	Composite	Weekly	Weekly Average
00610	Nitrogen, Ammonia total (as N)	<=	3.5	mg/L	Composite	Weekly	Daily Maximum
00610	Nitrogen, Ammonia total (as N)	<=	76	lb/d	Composite	Weekly	Weekly Average
00610	Nitrogen, Ammonia total (as N)	<=	51	lb/d	Composite	Weekly	Monthly Average
Description : External Outfall, Number : 001, Monitoring : Percent Removal, Season : All Year							
Code	Parameter	Qualifier	Value	Unit	Sample Type	Frequency	Statistical Base
80358	CBOD, 5-day, 20 C, %	>=	85	%	Calculated	Weekly	Monthly Average

	removal						Minimum
80358	CBOD, 5-day, 20 C, % removal	>=	40	%	Calculated	Weekly	Daily Minimum
81011	TSS, % removal	>=	40	%	Calculated	Three Per Week	Daily Minimum
81011	TSS, % removal	>=	85	%	Calculated	Three Per Week	Monthly Average Minimum
Description : External Outfall, Number : 001, Monitoring : Raw Sewage Influent, Season : All Year							
Code	Parameter	Qualifier	Value	Unit	Sample Type	Frequency	Statistical Base
00530	Total Suspended Solids (TSS)	Report	-	mg/L	Composite	Three Per Week	Monthly Average
00530	Total Suspended Solids (TSS)	Report	-	mg/L	Composite	Three Per Week	Daily Maximum
50050	Flow	Report	-	Mgal/d	Continuous	Daily	Monthly Average
50050	Flow	Report	-	Mgal/d	Continuous	Daily	Daily Maximum
80082	CBOD, 5-day, 20 C	Report	-	mg/L	Composite	Weekly	Daily Maximum
80082	CBOD, 5-day, 20 C	Report	-	mg/L	Composite	Weekly	Monthly Average
Description : External Outfall, Number : 001, Monitoring : Wet Weather, Season : All Year							
Code	Parameter	Qualifier	Value	Unit	Sample Type	Frequency	Statistical Base
74062	Overflow use, occurrences	Report	-	occur/mo	Occurrences	Continuous	Monthly Total

***This annual rolling average load value has conditions associated with wastewater plant optimization. See Section 3.7 for an explanation of those conditions. See the notes below for additional nutrient limit calculation and reporting requirements.**

Notes: The permittee shall achieve 85% removal of CBOD₅ and TSS on a monthly average basis. The permittee shall report all instances of overflow and/or bypasses. See Part 2.3.3.a for the definition of overflow and Part 1.3.5.1 for reporting requirements.

Unless elsewhere specified, summer months are May through October; winter months are November through April.

See Part 1.2.3 for test procedures.

See Part 3.4 for biomonitoring test and reporting requirements. See below for percent removal calculations.

Weekly monitoring and reporting for both total nitrogen (TN) and total phosphorus (TP) applies beginning the effective date of the permit. Effective immediately, the 431.7 lb/d TN and 47.7 lb/d TP become the 12-month (annual), rolling average load limits. The annual rolling average (lb/day) is calculated as the average of the loads collected during the preceding twelve month monitoring period beginning and reported on the DMR due the 15th of the following month. Each average is to be calculated from the sample concentration and the average effluent flow rate for the day of the sample. Because the monitoring frequency is changing from monthly to weekly, the first 12 months of annual rolling average loads will utilize a combination of weekly samples and monthly samples collected during the former and new permit terms. Beginning January 2019, after construction in 2017 and plant optimization in 2018, the annual rolling total load limits will apply based on weekly samples on the basis of the samples collecting during the most recent twelve calendar months.

Calculation Formulas:

Annual Rolling Average Load = $(\sum n \text{ loads (lb/d) during preceding 12 calendar months} \div n)$

Annual Rolling Total Load = $(\sum n \text{ loads (lb/d) during preceding 12 calendar months} \div n) \times 365 \text{ day/year}$

Where each n load = effluent concentration (mg/l) x average effluent flow for sample day (MGD) x 8.34

Total residual chlorine (TRC) monitoring shall be applicable when chlorine, bromine, or any other oxidants are added. The acceptable methods for analysis of TRC are any methods specified in Title 40 CFR, Part 136 as amended. The method detection level (MDL) for TRC shall not exceed 0.05 mg/l unless the permittee demonstrates that its MDL is higher. The permittee shall retain the documentation that justifies the higher MDL and have it available for review upon request. In cases where the permit limit is less than the MDL, the reporting of TRC at less than the MDL shall be interpreted to constitute compliance with the permit.

The wastewater discharge must be disinfected to the extent that viable coliform organisms are effectively eliminated. The concentration of the *E. coli* group after disinfection shall not exceed 126 cfu per 100 ml as the geometric mean calculated on the actual number of samples collected and tested for *E. coli* within the required reporting period. The permittee may collect more samples than specified as the monitoring frequency. Samples may not be collected at intervals of less than 12 hours. For the purpose of determining the geometric mean, individual samples having an *E. coli* group concentration of less than one (1) per 100 ml shall be considered as having a concentration of one (1) per 100 ml. In addition, the concentration of the *E. coli* group in any individual sample shall not exceed a specified maximum amount. A maximum daily limit of 487 colonies per 100 ml applies to lakes and exceptional Tennessee waters. A maximum daily limit of 941 colonies per 100 ml applies to all other recreational waters.

There shall be no distinctly visible floating scum, oil or other matter contained in the wastewater discharge. The wastewater discharge must not cause an objectionable color contrast in the receiving stream.

The wastewater discharge shall not contain pollutants in quantities that will be hazardous or otherwise detrimental to humans, livestock, wildlife, plant life, or fish and aquatic life in the receiving stream.

Sludge or any other material removed by any treatment works must be disposed of in a manner that prevents its entrance into or pollution of any surface or subsurface waters. Additionally, the disposal of such sludge or other material must be in compliance with the Tennessee Solid Waste Disposal Act, TCA 68-31-101 et seq. and the Tennessee Hazardous Waste Management Act, TCA 68-46-101 et seq.

Nothing in this permit authorizes take for the purposes of a facility's compliance with the Endangered Species Act. (40 C.F.R. 125.98(b)(1))

For the purpose of evaluating compliance with the permit limits established herein, where certain limits are below the State of Tennessee published required detection levels (RDLs) for any given effluent characteristics, the results of analyses below the RDL shall be reported as Below Detection Level (BDL), unless in specific cases other detection limits are demonstrated to be the best achievable because of the particular nature of the wastewater being analyzed.

For CBOD₅ and TSS, the treatment facility shall demonstrate a minimum of 85% removal efficiency on a monthly average basis. This is calculated by determining an average of all daily influent concentrations and comparing this to an average of all daily effluent concentrations. The formula for this calculation is as follows:

$$\left[1 - \frac{\text{average of daily effluent concentration}}{\text{average of daily influent concentration}} \right] \times 100\% = \% \text{ removal}$$

The treatment facility will also demonstrate 40% minimum removal of the CBOD₅ and TSS based upon each daily composite sample. The formula for this calculation is as follows:

$$\left[1 - \frac{\text{daily effluent concentration}}{\text{daily influent concentration}} \right] \times 100\% = \% \text{ removal}$$

1.2. MONITORING PROCEDURES

1.2.1. Representative Sampling

Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to insure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed, calibrated and maintained to insure that the accuracy of the measurements is consistent with accepted capability of that type of device. Devices selected shall be capable of measuring flows with a maximum deviation of less than plus or minus 10% from the true discharge rates throughout the range of expected discharge volumes.

Samples and measurements taken in compliance with the monitoring requirements specified above shall be representative of the volume and nature of the monitored discharge, and shall be taken at the following location(s):

Influent samples must be collected prior to mixing with any other wastewater being returned to the head of the plant, such as sludge return. Those systems with more than one influent line must collect samples from each and proportion the results by the flow from each line.

Effluent samples must be representative of the wastewater being discharged and collected prior to mixing with any other discharge or the receiving stream. This can be a different point for different parameters, but must be after all treatment for that parameter or all expected change:

- a. The chlorine residual must be measured after the chlorine contact chamber and any dechlorination. It may be to the advantage of the permittee to measure at the end of any long outfall lines.
- b. Samples for *E. coli* can be collected at any point between disinfection and the actual discharge.

- c. Systems with outfall lines less than one mile may measure dissolved oxygen as the wastewater leaves the treatment facility. For systems with dechlorination, dissolved oxygen must be measured after this step and as close to the end of the outfall line as possible.
- d. Total suspended solids and settleable solids can be collected at any point after the final clarifier.
- e. Biomonitoring tests (if required) shall be conducted on final effluent.

1.2.2. Sampling Frequency

Where the permit requires sampling and monitoring of a particular effluent characteristic(s) at a frequency of less than once per day or daily, the permittee is precluded from marking the "No Discharge" block on the Discharge Monitoring Report if there has been any discharge from that particular outfall during the period which coincides with the required monitoring frequency; i.e. if the required monitoring frequency is once per month or 1/month, the monitoring period is one month, and if the discharge occurs during only one day in that period then the permittee must sample on that day and report the results of analyses accordingly.

1.2.3. Test Procedures

- a. Test procedures for the analysis of pollutants shall conform to regulations published pursuant to Section 304 (h) of the Clean Water Act (the "Act"), as amended, under which such procedures may be required.
- b. Unless otherwise noted in the permit, all pollutant parameters shall be determined according to methods prescribed in Title 40, CFR, Part 136, as amended, promulgated pursuant to Section 304 (h) of the Act.
- c. Composite samples must be proportioned by flow at time of sampling. Aliquots may be collected manually or automatically. The sample aliquots must be maintained at ≤ 6 degrees Celsius during the compositing period.
- d. In instances where permit limits established through implementation of applicable water criteria are below analytical capabilities, compliance with those limits will be determined using the detection limits described in the TN Rules, Chapter 0400-40-03-.05(8).
- e. All sampling for total mercury at the municipal wastewater plant (application, pretreatment, etc.) shall use Methods 1631, 245.7 or any additional method in 40 CFR 136 with a maximum detection limit of 5 ng/L. For test methods requiring collection of a grab sample, the analysis may be conducted on a single grab or on a set of grabs composited in the testing lab in compliance with the quality control procedures prescribed by the method for each grab sample. When a single grab sample is analyzed, it shall be collected at such time that the treatment plant effluent would be expected to include the most likely sources of mercury in the municipal system.

1.2.4. Recording of Results

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

- a. The exact place, date and time of sampling;
- b. The exact person(s) collecting samples;
- c. The dates and times the analyses were performed;
- d. The person(s) or laboratory who performed the analyses;
- e. The analytical techniques or methods used, and;
- f. The results of all required analyses.

1.2.5. Records Retention

All records and information resulting from the monitoring activities required by this permit including all records of analyses performed and calibration and maintenance of instrumentation shall be retained for a minimum of three (3) years, or longer, if requested by the Division of Water Resources.

1.3. REPORTING

1.3.1. Monitoring Results

Monitoring results shall be recorded monthly and submitted monthly using NETDMR. Submittals shall be no later than 15 days after the completion of the reporting period. If NETDMR is not functioning, a completed DMR with an original signature shall be submitted to the following address::

**STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER RESOURCES
COMPLIANCE & ENFORCEMENT SECTION
William R. Snodgrass - Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor
Nashville, Tennessee 37243-1102**

If NETDMR is not functioning, a copy of the completed and signed DMR shall be mailed to the Cookeville Environmental Field Office (EFO) at the following address:

**STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER RESOURCES
Cookeville Environmental Field Office
1221 South Willow Avenue
Cookeville, Tennessee 38506**

A copy should be retained for the permittee's files. In addition, any communication regarding compliance with the conditions of this permit must be sent to the two offices listed above.

The first DMR is due on the 15th of the month following permit effectiveness.

DMRs and any other information or report must be signed and certified by a responsible corporate officer as defined in 40 CFR 122.22, a general partner or proprietor, or a principal municipal executive officer or ranking elected official, or his duly authorized representative. Such authorization must be submitted in writing and must explain the duties and responsibilities of the authorized representative.

The electronic submission of DMR data will be accepted only if formally approved beforehand by the division. For purposes of determining compliance with this permit, data approved by the division to be submitted electronically is legally equivalent to data submitted on signed and certified DMR forms.

1.3.2. Additional Monitoring by Permittee

If the permittee monitors any pollutant specifically limited by this permit more frequently than required at the location(s) designated, using approved analytical methods as specified herein, the results of such monitoring shall be included in the calculation and reporting of the values required in the DMR form. Such increased frequency shall also be indicated on the form.

1.3.3. Falsifying Results and/or Reports

Knowingly making any false statement on any report required by this permit or falsifying any result may result in the imposition of criminal penalties as provided for in Section 309 of the Federal Water Pollution Control Act, as amended, and in Section 69-3-115 of the Tennessee Water Quality Control Act.

1.3.4. Monthly Report of Operation

Monthly operational reports shall be submitted on standard forms to the appropriate Division of Water Resources Environmental Field Office in Jackson, Nashville, Chattanooga, Columbia, Cookeville, Memphis, Johnson City, or Knoxville. Reports shall be submitted by the 15th day of the month following data collection.

1.3.5. Bypass and Overflow Reporting

1.3.5.1. Report Requirements

A summary report of known or suspected instances of overflows in the collection system or bypass of wastewater treatment facilities shall accompany the Discharge Monitoring Report. The report must contain the date and duration of the instances of overflow and/or bypassing and the estimated quantity of wastewater released and/or bypassed.

The report must also detail activities undertaken during the reporting period to (1) determine if overflow is occurring in the collection system, (2) correct those known or suspected overflow points and (3) prevent future or possible overflows and any resulting bypassing at the treatment facility.

On the DMR, the permittee must report the number of sanitary sewer overflows, dry-weather overflows and in-plant bypasses separately. Three lines must be used on the DMR form, one for sanitary sewer overflows, one for dry-weather overflows and one for in-plant bypasses.

1.3.5.2. Anticipated Bypass Notification

If, because of unavoidable maintenance or construction, the permittee has need to create an in-plant bypass which would cause an effluent violation, the permittee must notify the division as soon as possible, but in any case, no later than 10 days prior to the date of the bypass.

1.3.6. Reporting Less Than Detection; Reporting Significant Figures

A permit limit may be less than the accepted detection level. If the samples are below the detection level, then report "BDL" or "NODI =B" on the DMRs. The permittee must use the correct detection levels in all analytical testing required in the permit. The required detection levels are listed in the Rules of the Department of Environment and Conservation, Division of Water Resources, Chapter 0400-40-03-.05(8).

For example, if the limit is 0.02 mg/l with a detection level of 0.05 mg/l and detection is shown; 0.05 mg/l must be reported. In contrast, if nothing is detected reporting "BDL" or "NODI =B" is acceptable.

Reported results are to correspond to the number of significant figures (decimal places) set forth in the permit conditions. The permittee shall round values, if allowed by the method of sample analysis, using a uniform rounding convention adopted by the permittee.

1.4. COMPLIANCE WITH SECTION 208

The limits and conditions in this permit shall require compliance with an area-wide waste treatment plan (208 Water Quality Management Plan) where such approved plan is applicable.

1.5. REOPENER CLAUSE

This permit shall be modified, or alternatively revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 307(a)(2) and 405(d)(2)(D) of the Clean Water Act, as amended, if the effluent standard, limitation or sludge disposal requirement so issued or approved:

- a. Contains different conditions or is otherwise more stringent than any condition in the permit; or
- b. Controls any pollutant or disposal method not addressed in the permit.

The permit as modified or reissued under this paragraph shall also contain any other requirements of the Act then applicable.

1.6. SCHEDULE OF COMPLIANCE

Full compliance and operational levels shall be attained from the effective date of this permit.

2.0. GENERAL PERMIT REQUIREMENTS

2.1. GENERAL PROVISIONS

2.1.1. Duty to Reapply

Permittee is not authorized to discharge after the expiration date of this permit. In order to receive authorization to discharge beyond the expiration date, the permittee shall submit such information and forms as are required to the Director of the Division of Water Resources (the "director") no later than 180 days prior to the expiration date. Such forms shall be properly signed and certified.

2.1.2. Right of Entry

The permittee shall allow the director, the Regional Administrator of the U.S. Environmental Protection Agency, or their authorized representatives, upon the presentation of credentials:

- a. To enter upon the permittee's premises where an effluent source is located or where records are required to be kept under the terms and conditions of this permit, and at reasonable times to copy these records;
- b. To inspect at reasonable times any monitoring equipment or method or any collection, treatment, pollution management, or discharge facilities required under this permit; and
- c. To sample at reasonable times any discharge of pollutants.

2.1.3. Availability of Reports

Except for data determined to be confidential under Section 308 of the Federal Water Pollution Control Act, as amended, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Division of Water Resources. As required by the Federal Act, effluent data shall not be considered confidential.

2.1.4. Proper Operation and Maintenance

- a. The permittee shall at all times properly operate and maintain all facilities and systems (and related appurtenances) for collection and treatment which are installed or used by the permittee to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance also includes adequate laboratory and process controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems, which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit. Backup continuous pH and flow monitoring equipment are not required.
- b. Dilution water shall not be added to comply with effluent requirements to achieve BCT, BPT, BAT and or other technology based effluent limitations such as those in State of Tennessee Rule 0400-40-05-.09.

2.1.5. Treatment Facility Failure (Industrial Sources)

The permittee, in order to maintain compliance with this permit, shall control production, all discharges, or both, upon reduction, loss, or failure of the treatment facility, until the facility is restored or an alternative method of treatment is provided. This requirement applies in such situations as the reduction, loss, or failure of the primary source of power.

2.1.6. Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations.

2.1.7. Severability

The provisions of this permit are severable. If any provision of this permit due to any circumstance, is held invalid, then the application of such provision to other circumstances and to the remainder of this permit shall not be affected thereby.

2.1.8. Other Information

If the permittee becomes aware of failure to submit any relevant facts in a permit application, or of submission of incorrect information in a permit application or in any report to the director, then the permittee shall promptly submit such facts or information.

2.2. CHANGES AFFECTING THE PERMIT

2.2.1. Planned Changes

The permittee shall give notice to the director as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

- a. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); or
- b. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants, which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1).

2.2.2. Permit Modification, Revocation, or Termination

- a. This permit may be modified, revoked and reissued, or terminated for cause as described in 40 CFR 122.62 and 122.64, Federal Register, Volume 49, No. 188 (Wednesday, September 26, 1984), as amended.
- b. The permittee shall furnish to the director, within a reasonable time, any information which the director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the director, upon request, copies of records required to be kept by this permit.
- c. If any applicable effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established for any toxic pollutant under Section 307(a) of the Federal Water Pollution Control Act, as amended, the director shall modify or revoke and reissue the permit to conform to the prohibition or to the effluent standard, providing that the effluent standard is more stringent than the limitation in the permit on the toxic pollutant. The permittee shall comply with these effluent standards or prohibitions within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified or revoked and reissued to incorporate the requirement.
- d. The filing of a request by the permittee for a modification, revocation, reissuance, termination, or notification of planned changes or anticipated noncompliance does not halt any permit condition.

2.2.3. Change of Ownership

This permit may be transferred to another party (provided there are neither modifications to the facility or its operations, nor any other changes which might affect the permit limits and conditions contained in the permit) by the permittee if:

- a. The permittee notifies the director of the proposed transfer at least 30 days in advance of the proposed transfer date;
- b. The notice includes a written agreement between the existing and new permittees containing a specified date for transfer of permit responsibility, coverage, and liability between them; and
- c. The director, within 30 days, does not notify the current permittee and the new permittee of his intent to modify, revoke or reissue, or terminate the permit and to require that a new application be filed rather than agreeing to the transfer of the permit.

Pursuant to the requirements of 40 CFR 122.61, concerning transfer of ownership, the permittee must provide the following information to the division in their formal notice of intent to transfer ownership: 1) the NPDES permit number of the subject permit; 2) the effective date of the proposed transfer; 3) the name and address of the transferor; 4) the name and address of the transferee; 5) the names of the responsible parties for both the transferor and transferee; 6) a statement that the transferee assumes responsibility for the subject NPDES permit; 7) a statement that the transferor relinquishes responsibility for the subject NPDES permit; 8) the signatures of the responsible parties for both the transferor and transferee pursuant to the requirements of 40 CFR 122.22(a), "Signatories to permit applications"; and, 9) a statement regarding any proposed modifications to the facility, its operations, or any other changes which might affect the permit limits and conditions contained in the permit.

2.2.4. Change of Mailing Address

The permittee shall promptly provide to the director written notice of any change of mailing address. In the absence of such notice the original address of the permittee will be assumed to be correct.

2.3. NONCOMPLIANCE

2.3.1. Effect of Noncompliance

All discharges shall be consistent with the terms and conditions of this permit. Any permit noncompliance constitutes a violation of applicable state and federal laws and is grounds for enforcement action, permit termination, permit modification, or denial of permit reissuance.

2.3.2. Reporting of Noncompliance

- a. 24-Hour Reporting

In the case of any noncompliance which could cause a threat to public drinking supplies, or any other discharge which could constitute a threat to human health or the environment, the required notice of non-compliance shall be provided to

the Division of Water Resources in the appropriate Environmental Field Office within 24-hours from the time the permittee becomes aware of the circumstances. (The Environmental Field Office should be contacted for names and phone numbers of environmental response team).

A written submission must be provided within five days of the time the permittee becomes aware of the circumstances unless the director on a case-by-case basis waives this requirement. The permittee shall provide the director with the following information:

- i. A description of the discharge and cause of noncompliance;
 - ii. The period of noncompliance, including exact dates and times or, if not corrected, the anticipated time the noncompliance is expected to continue; and
 - iii. The steps being taken to reduce, eliminate, and prevent recurrence of the noncomplying discharge.
- b. Scheduled Reporting

For instances of noncompliance which are not reported under subparagraph 2.3.2.a above, the permittee shall report the noncompliance on the Discharge Monitoring Report. The report shall contain all information concerning the steps taken, or planned, to reduce, eliminate, and prevent recurrence of the violation and the anticipated time the violation is expected to continue.

2.3.3. Overflow

- a. **"Overflow"** means any release of sewage from any portion of the collection, transmission, or treatment system other than through permitted outfalls.
- b. Overflows are prohibited.
- c. The permittee shall operate the collection system so as to avoid overflows.
- d. No new or additional flows shall be added upstream of any point in the collection system, which experiences chronic overflows (greater than 5 events per year) or would otherwise overload any portion of the system. Unless there is specific enforcement action to the contrary, the permittee is relieved of this requirement after: 1) an authorized representative of the Commissioner of the Department of Environment and Conservation has approved an engineering report and construction plans and specifications prepared in accordance with accepted engineering practices for correction of the problem; 2) the correction work is underway; and 3) the cumulative, peak-design, flows potentially added from new connections and line extensions upstream of any chronic overflow point are less than or proportional to the amount of inflow and infiltration removal documented upstream of that point. The inflow and infiltration reduction must be measured by the permittee using practices that are customary in the environmental engineering field and reported in an attachment to a Monthly Operating Report

submitted to the local TDEC Environmental Field Office. The data measurement period shall be sufficient to account for seasonal rainfall patterns and seasonal groundwater table elevations.

- e. In the event that more than 5 overflows have occurred from a single point in the collection system for reasons that may not warrant the self-imposed moratorium or completion of the actions identified in this paragraph, the permittee may request a meeting with the Division of Water Resources EFO staff to petition for a waiver based on mitigating evidence.

2.3.4. Upset

- a. "**Upset**" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.
- b. An upset shall constitute an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the permittee demonstrates, through properly signed, contemporaneous operating logs, or other relevant evidence that:
 - i. An upset occurred and that the permittee can identify the cause(s) of the upset;
 - ii. The permitted facility was at the time being operated in a prudent and workman-like manner and in compliance with proper operation and maintenance procedures;
 - iii. The permittee submitted information required under "Reporting of Noncompliance" within 24-hours of becoming aware of the upset (if this information is provided orally, a written submission must be provided within five days); and
 - iv. The permittee complied with any remedial measures required under "Adverse Impact."

2.3.5. Adverse Impact

The permittee shall take all reasonable steps to minimize any adverse impact to the waters of Tennessee resulting from noncompliance with this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge. It shall not be a defense for the permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

2.3.6. Bypass

- a. "**Bypass**" is the intentional diversion of waste streams from any portion of a treatment facility. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which would cause them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
- b. Bypasses are prohibited unless all of the following 3 conditions are met:
 - i. The bypass is unavoidable to prevent loss of life, personal injury, or severe property damage;
 - ii. There are no feasible alternatives to bypass, such as the construction and use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass, which occurred during normal periods of equipment downtime or preventative maintenance;
 - iii. The permittee submits notice of an unanticipated bypass to the Division of Water Resources in the appropriate Environmental Field Office within 24 hours of becoming aware of the bypass (if this information is provided orally, a written submission must be provided within five days). When the need for the bypass is foreseeable, prior notification shall be submitted to the director, if possible, at least 10 days before the date of the bypass.
- c. Bypasses not exceeding permit limitations are allowed **only** if the bypass is necessary for essential maintenance to assure efficient operation. All other bypasses are prohibited. Allowable bypasses not exceeding limitations are not subject to the reporting requirements of 2.3.6.b.iii, above.

2.3.7. Washout

- a. For domestic wastewater plants only, a "washout" shall be defined as loss of Mixed Liquor Suspended Solids (MLSS) of 30.00% or more. This refers to the MLSS in the aeration basin(s) only. This does not include MLSS decrease due to solids wasting to the sludge disposal system. A washout can be caused by improper operation or from peak flows due to infiltration and inflow.
- b. A washout is prohibited. If a washout occurs the permittee must report the incident to the Division of Water Resources in the appropriate Environmental Field Office within 24 hours by telephone. A written submission must be provided within five days. The washout must be noted on the discharge monitoring report. Each day of a washout is a separate violation.

2.4. LIABILITIES

2.4.1. Civil and Criminal Liability

Except as provided in permit conditions for "***Bypassing***," "***Overflow***," and "***Upset***," nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance. Notwithstanding this permit, the permittee shall remain liable for any damages sustained by the State of Tennessee, including but not limited to fish kills and losses of aquatic life and/or wildlife, as a result of the discharge of wastewater to any surface or subsurface waters. Additionally, notwithstanding this Permit, it shall be the responsibility of the permittee to conduct its wastewater treatment and/or discharge activities in a manner such that public or private nuisances or health hazards will not be created.

2.4.2. Liability Under State Law

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or the Federal Water Pollution Control Act, as amended.

3.0. PERMIT SPECIFIC REQUIREMENTS

3.1. CERTIFIED OPERATOR

The waste treatment facilities shall be operated under the supervision of a certified wastewater treatment operator and the collection system shall be operated under the supervision of a certified collection system operator in accordance with the Water Environmental Health Act of 1984.

3.2. POTW PRETREATMENT PROGRAM GENERAL PROVISIONS

As an update of information previously submitted to the division, the permittee will undertake the following activity.

- a. The permittee has been delegated the primary responsibility and therefore becomes the "control authority" for enforcing the 40 CFR 403 General Pretreatment Regulations. Where multiple plants are concerned the permittee is responsible for the Pretreatment Program for all plants within its jurisdiction. The permittee shall implement and enforce the Industrial Pretreatment Program in accordance with Section 403(b)(8) of the Clean Water Act, the Federal Pretreatment Regulations 40 CFR 403, Tennessee Water Quality Control Act Part 69-3-123 through 69-3-128, and the legal authorities, policies, procedures, and financial provisions contained in its approved Pretreatment Program, except to the extent this permit imposed stricter requirements. Such implementation shall require but not limit the permittee to do the following:
 - i. Carry out inspection, surveillance, and monitoring procedures which will determine, independent of information supplied by the industrial user (IU), whether the IU is in compliance with the pretreatment standards;
 - ii. Require development, as necessary, of compliance schedules for each IU for the installation of control technologies to meet applicable pretreatment standards;
 - iii. Require all industrial users to comply with all applicable monitoring and reporting requirements outlined in the approved pretreatment program and IU permit;
 - iv. Maintain and update, as necessary, records identifying the nature and character of industrial user discharges, and retain such records for a minimum of three (3) years;
 - v. Obtain appropriate remedies for noncompliance by an IU with any pretreatment standard and/or requirement;

- vi. Publish annually, pursuant to 40 CFR 403.8 (f)(2)(viii), a list of industrial users that have significantly violated pretreatment requirements and standards during the previous twelve-month period.
- vii. Maintain an adequate revenue structure for continued operation of the pretreatment program.
- viii. Update its Industrial Waste Survey at least once every five years. Results of this update shall be submitted to the Division of Water Resources, Pretreatment Section within 120 days of the effective date of this permit, unless such a survey has been submitted within 3 years of the effective date.
- ix. Submit a written technical evaluation of the need to revise local limits within 120 days of the effective date of this permit to the state pretreatment program coordinator. The evaluation shall include the most recent pass-through limits proposed by the division. The technical evaluation shall be based on practical and specialized knowledge of the local program and not be limited by a specified written format.
- b. The permittee shall enforce 40 CFR 403.5, "prohibited discharges". Pollutants introduced into the POTW by a non-domestic source shall not cause pass through or interference as defined in 40 CFR Part 403.3. These general prohibitions and the specific prohibitions in this section apply to all non-domestic sources introducing pollutants into the POTW whether the source is subject to other National Pretreatment Standards or any state or local pretreatment requirements.

Specific prohibitions. Under no circumstances shall the permittee allow introduction of the following wastes in the waste treatment system:

- i. Pollutants which create a fire or explosion hazard in the POTW;
- ii. Pollutants which will cause corrosive structural damage to the treatment works, but in no case discharges with pH less than 5.0 unless the system is specifically designed to accept such discharges.
- iii. Solid or viscous pollutants in amounts which will cause obstruction to the flow in the treatment system resulting in interference.
- iv. Any pollutant, including oxygen-demanding pollutants (BOD, etc.) released in a discharge at a flow rate and/or pollutant concentration which will cause interference with the treatment works.
- v. Heat in amounts which will inhibit biological activity in the treatment works resulting in interference, but in no case heat in such quantities that the temperature at the treatment works exceeds 40°C (104°F) unless the works are designed to accommodate such heat.

- vi. Any priority pollutant in amounts that will contaminate the treatment works sludge.
 - vii. Petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through;
 - viii. Pollutants which result in the presence of toxic gases, vapors or fumes within the POTW in a quantity that may cause acute worker health and safety problems;
 - ix. Any trucked or hauled pollutants except at discharge points designated by the POTW.
- c. The permittee shall notify the Tennessee Division of Water Resources of any of the following changes in user discharge to the system no later than 30 days prior to change of discharge:
- i. New introductions into such works of pollutants from any source which would be a new source as defined in Section 306 of the Act if such source were discharging pollutants.
 - ii. New introductions of pollutants into such works from a source which would be subject to Section 301 of the "Federal Water Quality Act as Amended" if it were discharging such pollutants.
 - iii. A substantial change in volume or character of pollutants being introduced into such works by a source already discharging pollutants into such works at the time the permit is issued.

This notice will include information on the quantity and quality of the wastewater introduced by the new source into the publicly owned treatment works, and on any anticipated impact on the effluent discharged from such works. If this discharge necessitates a revision of the current NPDES permit or pass-through guidelines, discharge by this source is prohibited until the Tennessee Division of Water Resources gives final authorization.

d. Reporting Requirements

The permittee shall provide a semiannual report briefly describing the permittee's pretreatment program activities over the previous six-month period. Reporting periods shall end on the last day of the months of March and September. The report shall be submitted to the Division of Water Resources, Central Office and a copy to the appropriate Environmental Field Office no later than the 28th day of the month following each reporting period. For control authorities with multiple STPs, one report should be submitted with a separate Form 1 for each STP. Each report shall conform to the format set forth in the State POTW Pretreatment Semiannual Report Package which contains information regarding:

- i. An updated listing of the permittee's industrial users.

- ii. Results of sampling of the influent and effluent of the wastewater treatment plant. At least once each reporting period, the permittee shall analyze the wastewater treatment plant influent and effluent for the following pollutants, using the prescribed sampling procedures:

Pollutant	Sample Type
chromium, trivalent	24-hour composite
chromium, hexavalent	24-hour composite
copper	24-hour composite
lead	24-hour composite
nickel	24-hour composite
zinc	24-hour composite
cadmium	24-hour composite
mercury	Per method requirements
silver	24-hour composite
total phenols	grab
cyanide	grab

If any particular pollutant is analyzed more frequently than is required, the permittee shall report the maximum and average values on the semiannual report. All upsets, interferences, and pass-through violations must also be reported on the semiannual report, the actions that were taken to determine the causes of the incidents and the steps that have been taken to prevent the incidents from recurring.

At least once during the term of this permit, the permittee shall analyze the effluent from the STP (and report the results in the next regularly scheduled report) for the following pollutants:

chromium III	cyanide	phthalates, sum of the following: bis (2-ethylhexyl) phthalate butyl benzylphthalate di-n-butylphthalate diethyl phthalate
chromium VI	silver	
copper	benzene	
lead	carbon tetrachloride	
nickel	chloroform	
zinc	ethylbenzene	1,2 trans-dichloroethylene
cadmium	methylene chloride	tetrachloroethylene
mercury	naphthalene	toluene
phenols, total	1,1,1 trichloroethane	trichloroethylene

- iii. Compliance with categorical and local standards, and review of industrial compliance, which includes a summary of the compliance status for all permitted industries. Also included is information on the number and type of major violations of pretreatment regulations, and the actions taken by the

POTW to obtain compliance. The effluent from all significant industrial users must be analyzed for the appropriate pollutants at least once every 12 months.

- iv. A list of industries in significant non-compliance as published in local newspapers in accordance with the requirements set forth in 40 CFR 403.8(f)(2)(viii).
- v. A description of all substantive changes made to the permittee's pretreatment program. Any such changes shall receive prior approval. Substantive changes include, but are not limited to, any change in any ordinance, major modification in the program's administrative structure, local limits, or a change in the method of funding the program.
- vi. Summary of permittee's industrial user inspections, which includes information on the number and type of industry inspected. All significant industrial users must be inspected at least once per year.

3.3. BIOSOLIDS MANAGEMENT PRACTICES

All sludge and/or biosolids use or disposal must comply with 40 CFR 503 et seq. Biosolids shall be sampled and analyzed at a frequency dependent on the amount used annually.

Any facility that land applies non-exceptional quality biosolids must obtain an appropriate permit from the division in accordance with Chapter 0400-40-15.

- a. Reopener: If an applicable "acceptable management practice" or numerical limitation for pollutants in sewage sludge promulgated under Section 405(d)(2) of the Clean Water Act, as amended by the Water Quality Act of 1987, is more stringent than the sludge pollutant limit or acceptable management practice in this permit, or controls a pollutant not limited in this permit, this permit shall be promptly modified or revoked and reissued to conform to the requirements promulgated under Section 405(d)(2). The permittee shall comply with the limitations by no later than the compliance deadline specified in the applicable regulations as required by Section 405(d)(2) of the Clean Water Act.
- b. Notice of change in sludge disposal practice: The permittee shall give prior notice to the director of any change planned in the permittee's sludge disposal practice.

3.4. BIOMONITORING REQUIREMENTS, CHRONIC

The permittee shall conduct a 3-Brood *Ceriodaphnia dubia* Survival and Reproduction Test and a 7-Day Fathead Minnow (*Pimephales promelas*) Larval Survival and Growth Test on samples of final effluent from Outfall 001.

The measured endpoint for toxicity will be the inhibition concentration causing 25% reduction in survival, reproduction and growth (IC_{25}) of the test organisms. The IC_{25} shall be determined based on a 25% reduction as compared to the controls, and as derived from linear interpolation. The average reproduction and growth responses will be determined based on the number of *Ceriodaphnia dubia* or *Pimephales promelas* larvae used to initiate the test.

Test shall be conducted and its results reported based on appropriate replicates of a total of five serial dilutions and a control, using the percent effluent dilutions as presented in the following table:

Serial Dilutions for Whole Effluent Toxicity (WET) Testing					
Permit Limit (PL)	0.50 X PL	0.25 X PL	0.125 X PL	0.0625 X PL	Control
% effluent					
100	50	25	12.5	6.25	0

The dilution/control water used will be moderately hard water as described in [Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms](#), EPA-821-R-02-013 (or the most current edition). A chronic standard reference toxicant quality assurance test shall be conducted with each species used in the toxicity tests and the results submitted with the discharge monitoring report. Additionally, the analysis of this multi-concentration test shall include review of the concentration-response relationship to ensure that calculated test results are interpreted appropriately.

The toxicity tests specified herein shall be conducted annually (1/year) for Outfall 001 and begin no later than 365 days from the effective date of this permit.

Toxicity will be demonstrated if the IC_{25} is less than or equal to the permit limit indicated for each outfall in the above table(s). Toxicity demonstrated by the tests specified herein constitutes a violation of this permit.

All tests will be conducted using a minimum of three 24-hour flow-proportionate composite samples of final effluent collected on days 1, 3 and 5. If, in any control more than 20% of the test organisms die in 7 days, the test (control and effluent) is considered invalid and the test shall be repeated within two (2) weeks. Furthermore, if the results do not meet the acceptability criteria in [Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms](#), EPA-821-R-02-013 (or the most current edition), or if the required concentration-response review fails to yield a valid relationship per guidance contained in [Method Guidance and Recommendations for Whole Effluent Toxicity \(WET\) Testing](#), EPA-821-B-00-004 (or the most current edition), that test shall be repeated. Any test initiated but terminated before completion must also be reported along with a complete explanation for the termination.

In the event of a test failure, the permittee must start a follow-up test within 2 weeks and submit results from a follow-up test within 30 days from obtaining initial WET testing results. The follow-up test must be conducted using the same serial

dilutions as presented in the corresponding table(s) above. **The follow-up test will not negate an initial failed test. In addition, the failure of a follow-up test will constitute a separate permit violation.**

In the event of 2 consecutive test failures or 3 test failures within a 12-month period for the same outfall, the permittee must initiate a Toxicity Identification Evaluation/Toxicity Reduction Evaluation (TIE/TRE) study within 30 days and so notify the division by letter. This notification shall include a schedule of activities for the initial investigation of that outfall. **During the term of the TIE/TRE study, the frequency of biomonitoring shall be once every three months.** Additionally, the permittee shall submit progress reports once every three months throughout the term of the TIE/TRE study. The toxicity must be reduced to allowable limits for that outfall within 2 years of initiation of the TIE/TRE study. Subsequent to the results obtained from the TIE/TRE studies, the permittee may request an extension of the TIE/TRE study period if necessary to conduct further analyses. The final determination of any extension period will be made at the discretion of the division.

The TIE/TRE study may be terminated at any time upon the completion and submission of 2 consecutive tests (for the same outfall) demonstrating compliance. Following the completion of TIE/TRE study, the frequency of monitoring will return to a regular schedule, as defined previously in this section as well in Part I of the permit. **During the course of the TIE/TRE study, the permittee will continue to conduct toxicity testing of the outfall being investigated at the frequency of once every three months but will not be required to perform follow-up tests for that outfall during the period of TIE/TRE study.**

Test procedures, quality assurance practices, determinations of effluent survival/reproduction and survival/growth values, and report formats will be made in accordance with [Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms](#), EPA-821-R-02-013, or the most current edition.

Results of all tests, reference toxicant information, copies of raw data sheets, statistical analysis and chemical analyses shall be compiled in a report. The report will be written in accordance with [Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms](#), EPA-821-R-02-013, or the most current edition.

Two copies of biomonitoring reports (including follow-up reports) shall be submitted to the division. One copy of the report shall be submitted along with the discharge monitoring report (DMR). The second copy shall be submitted to the local Division of Water Resources office address (see table below):

Division of Water Resources			
Office	Location	Zip Code	Phone No.
Chattanooga	1301 Riverfront Parkway, Suite 206	37402-2013	(423) 634-5745
Jackson	1625 Hollywood Drive	38305	(731) 512-1300
Cookeville	1221 South Willow Avenue	38506	(931) 432-4015
Columbia	2484 Park Plus Drive	38401	(931) 380-3371
Johnson City	2305 Silverdale Road	37601	(423) 854-5400
Knoxville	3711 Middlebrook Pike	37921	(865) 594-6035
Memphis	8383 Wolf Lake Drive, Bartlett	38133-4119	(901) 371-3000
Nashville	711 R.S. Gass Boulevard	37243-1550	(615) 687-7000

3.5. PLACEMENT OF SIGNS

Within sixty (60) days of the effective date of this permit, the permittee shall place and maintain a sign(s) at each outfall and any bypass/overflow point in the collection system. For the purposes of this requirement, any bypass/overflow point that has discharged five (5) or more times in the last year must be so posted. The sign(s) should be clearly visible to the public from the bank and the receiving stream. The minimum sign size should be two feet by two feet (2' x 2') with one-inch (1") letters. The sign should be made of durable material and have a white background with black letters.

The sign(s) are to provide notice to the public as to the nature of the discharge and, in the case of the permitted outfalls, that the discharge is regulated by the Tennessee Department of Environment and Conservation, Division of Water Resources. The following is given as an example of the minimal amount of information that must be included on the sign:

Permitted CSO or unpermitted bypass/overflow point:

UNTREATED WASTEWATER DISCHARGE POINT
City of Crossville
(931) 484-7060
NPDES Permit NO. TN0024996
TENNESSEE DIVISION OF WATER RESOURCES
1-888-891-8332 ENVIRONMENTAL FIELD OFFICE - Cookeville

NPDES Permitted Municipal/Sanitary Outfall:

TREATED MUNICIPAL/SANITARY WASTEWATER
City of Crossville
(931) 484-7060
NPDES Permit NO. TN0024996
TENNESSEE DIVISION OF WATER RESOURCES
1-888-891-8332 ENVIRONMENTAL FIELD OFFICE - Cookeville

No later than sixty (60) days from the effective date of this permit, the permittee shall have the above sign(s) on display in the location specified.

3.6. ANTIDegradation

Pursuant to the Rules of the Tennessee Department of Environment and Conservation, Chapter 0400-40-03-.06, titled "Tennessee Antidegradation Statement," which prohibits the degradation of exceptional Tennessee waters and the increased discharges of substances that cause or contribute to impairment, the permittee shall further be required, pursuant to the terms and conditions of this permit, to comply with the effluent limitations and schedules of compliance required to implement applicable water quality standards, to comply with a State Water Quality Plan or other state or federal laws or regulations, or where practicable, to comply with a standard permitting no discharge of pollutants.

3.7 PLANT OPTIMIZATION FOR NUTRIENT REDUCTION

After construction of optimization modifications in 2017, the permittee shall complete an evaluation of alternative methods of operating the existing wastewater facility to optimize the removal of both nitrogen and phosphorus year-round. For the purposes of nutrient removal, optimization shall mean methods that maximize removal with the least amount of intentional introduction of chemical compounds into the waste treatment process possible. The methods to be evaluated include, but are not limited to, operational changes that are designed to enhance nitrification and phosphorus removal such as creation of anoxic zones, septage management practices, side stream management or by affecting modifications to processes or operations of its industrial pretreatment waste streams that contain nutrients (including ammonia). The permittee shall seek to implement the changes necessary to reduce loading to 76,169 lb/year total nitrogen and 8,455 lb/year total phosphorus as annual rolling averages calculated and reported monthly beginning in calendar year 2019.

Enforcement Discretion

In order to qualify for enforcement discretion during the construction of the optimization improvements in 2017, the permittee shall give the division written notice of when optimization efforts will begin. Notice shall be submitted to water.permits@tn.gov and directed to the attention of the permit writer for NPDES permit # TN0024996. After receipt of that written notification and for the duration of the construction and start-up of the optimized equipment, if optimization activities result in a value or values that cause excursion of the lb/day rolling average(s), or effluent ammonia, the permittee shall report the lb/day and/or ammonia value in the comment section of the discharge monitoring report (DMR), attach the spreadsheet identifying the excursion-causing values and related calculations, and code the associated parameter as NODI=3 (report attached) on the DMR.

Interim Report

The permittee shall provide a brief annual update on progress toward nutrient removal optimization by January 15th of 2018 and 2019. The interim report is to summarize the optimization efforts in 2017 (construction) and 2018 (post construction). This report must summarize activities related to optimizing removal efficiencies and track trends relative to the previous year(s). The permittee shall submit these reports to the division's electronic mailbox at water.permits@tn.gov or to the central office permit section at TDEC-Division of Water Resources, Water-

Based Systems Unit, William R. Snodgrass TN Tower, 11th Fl, 312 Rosa L. Parks Ave., Nashville, TN 37243.

Test Methods

Wastewater characterization conducted internally by the permittee for nutrient optimization purposes may deviate from approved methods contained in 40 CFR Part 136. However, effluent characterization conducted for monthly DMR reporting shall use approved methods in 40 CFR Part 136.

4.0. DEFINITIONS AND ACRONYMS

4.1. DEFINITIONS

"Biosolids" are treated sewage sludge that have contaminant concentrations less than or equal to the contaminant concentrations listed in Table 1 of subparagraph (3)(b) of Rule 0400-40-15-.02, meet any one of the ten vector attraction reduction options listed in part (4)(b)1, 2, 3, 4, 5, 6, 7, 8, 9, or 10 of Rule 0400-40-15-.04, and meet either one of the six pathogen reduction alternatives for Class A listed in part (3)(a)3, 4, 5, 6, 7, or 8, or one of the three pathogen reduction alternatives for Class B listed in part (3)(b)2, 3, or 4 of Rule 0400-40-15-.04.

A **"bypass"** is defined as the intentional diversion of waste streams from any portion of a treatment facility.

A **"calendar day"** is defined as the 24-hour period from midnight to midnight or any other 24-hour period that reasonably approximates the midnight to midnight time period.

A **"composite sample"** is a combination of not less than 8 influent or effluent portions, of at least 100 ml, collected over a 24-hour period. Under certain circumstances a lesser time period may be allowed, but in no case, less than 8 hours.

The **"daily maximum concentration"** is a limitation on the average concentration in units of mass per volume (e.g. milligrams per liter), of the discharge during any calendar day. When a proportional-to-flow composite sampling device is used, the daily concentration is the concentration of that 24-hour composite; when other sampling means are used, the daily concentration is the arithmetic mean of the concentrations of equal volume samples collected during any calendar day or sampling period.

"Discharge" or "discharge of a pollutant" refers to the addition of pollutants to waters from a source.

A **"dry weather overflow"** is a type of sanitary sewer overflow and is defined as one day or any portion of a day in which unpermitted discharge of wastewater from the collection or treatment system other than through the permitted outfall occurs and is not directly related to a rainfall event. Discharges from more than one point within a 24-hour period shall be counted as separate overflows.

"Degradation" means the alteration of the properties of waters by the addition of pollutants, withdrawal of water, or removal of habitat, except those alterations of a short duration.

“De Minimis” - Degradation of a small magnitude, as provided in this paragraph.

(a) Discharges and withdrawals

1. Subject to the limitation in part 3 of this subparagraph, a single discharge other than those from new domestic wastewater sources will be considered de minimis if it uses less than five percent of the available assimilative capacity for the substance being discharged.
2. Subject to the limitation in part 3 of this subparagraph, a single water withdrawal will be considered de minimis if it removes less than five percent of the 7Q10 flow of the stream.
3. If more than one activity described in part 1 or 2 of this subparagraph has been authorized in a segment and the total of the authorized and proposed impacts uses no more than 10% of the assimilative capacity, or 7Q10 low flow, they are presumed to be de minimis. Where the total of the authorized and proposed impacts uses 10% of the assimilative capacity, or 7Q10 low flow, additional degradation may only be treated as de minimis if the Division finds on a scientific basis that the additional degradation has an insignificant effect on the resource.

(b) Habitat alterations authorized by an Aquatic Resource Alteration Permit (ARAP) are de minimis if the Division finds that the impacts, individually and cumulatively are offset by impact minimization and/or in-system mitigation, provided however, in ONRWs the mitigation must occur within the ONRW.

An **“ecoregion”** is a relatively homogeneous area defined by similarity of climate, landform, soil, potential natural vegetation, hydrology, or other ecologically relevant variables.

The **“geometric mean”** of any set of values is the n^{th} root of the product of the individual values where “n” is equal to the number of individual values. The geometric mean is equivalent to the antilog of the arithmetic mean of the logarithms of the individual values. For the purposes of calculating the geometric mean, values of zero (0) shall be considered to be one (1).

A **“grab sample”** is a single influent or effluent sample collected at a particular time.

The **“instantaneous maximum concentration”** is a limitation on the concentration, in milligrams per liter, of any pollutant contained in the wastewater discharge determined from a grab sample taken from the discharge at any point in time.

The **“instantaneous minimum concentration”** is the minimum allowable concentration, in milligrams per liter, of a pollutant parameter contained in the wastewater discharge determined from a grab sample taken from the discharge at any point in time.

The "**monthly average amount**", shall be determined by the summation of all the measured daily discharges by weight divided by the number of days during the calendar month when the measurements were made.

The "**monthly average concentration**", other than for *E. coli* bacteria, is the arithmetic mean of all the composite or grab samples collected in a one-calendar month period.

A "**one week period**" (or "**calendar-week**") is defined as the period from Sunday through Saturday. For reporting purposes, a calendar week that contains a change of month shall be considered part of the latter month.

"**Pollutant**" means sewage, industrial wastes, or other wastes.

A "**quarter**" is defined as any one of the following three-month periods: January 1 through March 31, April 1 through June 30, July 1 through September 30, and/or October 1 through December 31.

A "**rainfall event**" is defined as any occurrence of rain, preceded by 10 hours without precipitation that results in an accumulation of 0.01 inches or more. Instances of rainfall occurring within 10 hours of each other will be considered a single rainfall event.

A "**rationale**" (or "fact sheet") is a document that is prepared when drafting an NPDES permit or permit action. It provides the technical, regulatory and administrative basis for an agency's permit decision.

A "**reference site**" means least impacted waters within an ecoregion that have been monitored to establish a baseline to which alterations of other waters can be compared.

A "**reference condition**" is a parameter-specific set of data from regional reference sites that establish the statistical range of values for that particular substance at least-impacted streams.

A "**sanitary sewer overflow (SSO)**" is defined as an unpermitted discharge of wastewater from the collection or treatment system other than through the permitted outfall.

"**Sewage**" means water-carried waste or discharges from human beings or animals, from residences, public or private buildings, or industrial establishments, or boats, together with such other wastes and ground, surface, storm, or other water as may be present.

"**Severe property damage**" when used to consider the allowance of a bypass or SSO means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence

of a bypass or SSO. Severe property damage does not mean economic loss caused by delays in production.

“Sewerage system” means the conduits, sewers, and all devices and appurtenances by means of which sewage and other waste is collected, pumped, treated, or disposed.

“Sludge” or **“sewage sludge”** is solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works. Sewage sludge includes, but is not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment processes; and a material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screenings generated during preliminary treatment of domestic sewage in a treatment works.

A **“subecoregion”** is a smaller, more homogenous area that has been delineated within an ecoregion.

“Upset” means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

The term, **“washout”** is applicable to activated sludge plants and is defined as loss of mixed liquor suspended solids (MLSS) of 30.00% or more from the aeration basin(s).

“Waters” means any and all water, public or private, on or beneath the surface of the ground, which are contained within, flow through, or border upon Tennessee or any portion thereof except those bodies of water confined to and retained within the limits of private property in single ownership which do not combine or effect a junction with natural surface or underground waters.

The **“weekly average amount”**, shall be determined by the summation of all the measured daily discharges by weight divided by the number of days during the calendar week when the measurements were made.

The **“weekly average concentration”**, is the arithmetic mean of all the composite samples collected in a one-week period. The permittee must report the highest weekly average in the one-month period.

4.2. ACRONYMS AND ABBREVIATIONS

1Q10 – 1-day minimum, 10-year recurrence interval

30Q20 – 30-day minimum, 20-year recurrence interval

7Q10 – 7-day minimum, 10-year recurrence interval
BAT – best available technology economically achievable
BCT – best conventional pollutant control technology
BDL – below detection level
BOD₅ – five day biochemical oxygen demand
BPT – best practicable control technology currently available
CBOD₅ – five day carbonaceous biochemical oxygen demand
CEI – compliance evaluation inspection
CFR – code of federal regulations
CFS – cubic feet per second
CFU – colony forming units
CIU – categorical industrial user
CSO – combined sewer overflow
DMR – discharge monitoring report
D.O. – dissolved oxygen
E. coli – *Escherichia coli*
EFO – environmental field office
LB(lb) - pound
IC₂₅ – inhibition concentration causing 25% reduction in survival, reproduction and growth of the test organisms
IU – industrial user
IWS – industrial waste survey
LC₅₀ – acute test causing 50% lethality
MDL – method detection level
MGD – million gallons per day
MG/L(mg/l) – milligrams per liter
ML – minimum level of quantification
ml – milliliter
MLSS – mixed liquor suspended solids
MOR – monthly operating report
NODI – no discharge
NPDES – national pollutant discharge elimination system
PL – permit limit
POTW – publicly owned treatment works

RDL – required detection limit

SAR – semi-annual [pretreatment program] report

SIU – significant industrial user

SSO – sanitary sewer overflow

STP – sewage treatment plant

TCA – Tennessee code annotated

TDEC – Tennessee Department of Environment and Conservation

TIE/TRE – toxicity identification evaluation/toxicity reduction evaluation

TMDL – total maximum daily load

TRC – total residual chlorine

TSS – total suspended solids

WQBEL – water quality based effluent limit

ADDENDUM TO RATIONALE AT PERMIT ISSUE

City of Crossville
NPDES Permit No. TN0024996
Date: 12/30/16
Permit Writer: Wade Murphy

The Tennessee Clean Water Network (TCWN) commented on the terms and conditions of this permit by letter dated November 29, 2016.

The TCWN pointed out typographical errors in the nutrient limit qualifiers and in Section 3.7 of the permit.

The draft permit proposed nutrient limits in Part 1 of the permit with qualifiers of “greater than or equal to” (\geq). This final permit corrects all 4 nutrient limit qualifiers to “less than or equal to” (\leq). Additionally, the TCWN pointed out that the optimization requirement in Section 3.7 of the permit qualified the 8,455 lb/year total phosphorous limit with the parenthetical expression “(target only/not limit)”. The division has deleted that expression from the final permit. Factors corroborating that its inclusion in the draft was a typographical error are: 1) the same expression did not qualify the comparable lb/yr nitrogen limit and 2) both the lb/yr limits apply without any qualification in Part 1 of the permit beginning in 2019. The division appreciates the TCWN pointing these typographical errors out. The division does recognize that after the initial plant upgrades are made in 2017, optimizing the treatment plant in 2018 to meet the limits that will apply in 2019 will, in terms of plant operation, present as working to meet a target. However, both values apply as limits.

The TCWN alleges that the initial limits do not cap existing nutrient loads, that a 95th percentile calculation is not an appropriate means to establish water quality based effluent limits.

The division imposes the initial load limits for nitrogen and phosphorous which apply immediately to comply with the narrative, anti-degradation provision in state water quality standards that does not allow new or increased discharges that would cause measurable degradation of the unavailable parameter. Technically, this permit does not propose a new or increased discharge from the 3.5 MGD POTW. The capped limit, derived from existing effluent characterization, serves several purposes. It serves to set a boundary representing the existing load contribution into the treatment plant and the ability of the current treatment plant to remove those nutrient loads, and it serves as a basis for planning future nutrient reductions. Therefore, the division does not intend for the calculation to derive water quality-based effluent limits.

TCWN maintains that water quality-based effluent limits are required by law for facilities contributing to impairments and that these limits must be expressed as monthly average concentrations as well as loads.

Tennessee only has a narrative nutrient standard and a definition in an interpretative guidance document that it uses to identify streams that do not meet the standard. A

summary of the division's research presented in the same interpretative guidance document indicates that high nutrient levels are not necessarily stressful to biota and that it is more likely that nutrients have indirect effects on biota via algae and the substrate changes caused by algae. The division has been unable to statistically identify a relationship between nutrient levels and benthic community integrity, so mathematically it is impossible to develop monthly average or daily maximum limits for a function that does not exist.

The division appreciates TCWN's participation in the permit process.

RATIONALE

City of Crossville
NPDES Permit No. TN0024996
Date: December 30, 2016
Permit Writer: Wade Murphy

1. FACILITY INFORMATION

City of Crossville
Mr. Steve Hill - City Manager
Crossville, Cumberland County, Tennessee
(931) 484-7060
Treatment Plant Average Design Flow: 3.5 MGD
Percentage Industrial Flow: <5% of actual average flow
Treatment Description: Activated sludge process preceded by bar screening and grit removal and followed by UV disinfecting. Land application of Class A Biosolids.
Certified Operator Grades: STP:4; CS: 1; Date Rated: 04/01/99

2. RECEIVING STREAM INFORMATION

Obed River at mile 38.6
Watershed Group: Emory
Hydrocode: 06010208
Low Flow: 7Q10 = 0 MGD (0 CFS)
Low Flow Reference:
USGS Stream Stats Tool
Water Quality Designation: Unavailable conditions water
Stream Classification Categories:

Domestic Wtr Supply	Industrial	Fish & Aquatic	Recreation
		X	X
Livestock Wtr & Wlife	Irrigation	Navigation	
X	X		

Water Quality Assessment: Not supporting

3. CURRENT PERMIT STATUS

Permit Type:	Municipal
Classification:	Major
Issuance Date:	31-DEC-11
Expiration Date:	31-DEC-16
Effective Date:	01-FEB-12

4. NEW PERMIT LIMITATIONS AND COMPLIANCE SCHEDULE SUMMARY

- a. The division proposes several changes for this permit cycle. These changes are discussed in further detail below:
- Conductivity monitoring and reporting is no longer required (see below);
 - Selenium monitoring and reporting is no longer required (see 6.7 below);
 - Silver monitoring and reporting is no longer required (see 6.7 below);
 - Load limits for total nitrogen and total phosphorus are added (see 6.4 below);
 - Optimization for biological nutrient removal is added (see 6.4 below)

Conductivity

This monitoring was added to the previous permit in support of Crossville's previously planned intent to develop a Habitat Conservation Plan (HCP) under the Federal Endangered Species Act. The Habitat Conservation Plan is integral to the incidental take regulation of the U.S. Fish and Wildlife Service. With an approved Habitat Conservation Plan, participants in the plan can proceed with planned activities as long as harm to endangered species is avoided, minimized or mitigated. Discharge from the Crossville STP was an activity being previously considered as an activity to be covered by the plan due to downstream segments of the Obed River being critical habitat for threatened and endangered species. One specie, the Spottfin Chub (a fish), is known to respond negatively to increased conductivity.

The monthly average and daily maximum values of weekly samples for effluent conductivity measured between February 2012 and September 2016 are included in Appendix 5 for ease of reference. The average and daily maximum values are less than 600 micromhos per centimeter (umho/cm) on average. These values are higher than ecoregion reference stream values. For example, Daddy's Creek in Cumberland County (ECO68A26) generally has conductivities less than 100 umho/cm. The division appreciates Crossville's willingness to conduct conductivity analyses in the previous permit cycle in support of the plan's development.

Plant Expansion to 5.0 MGD via Alternative Discharge Locations

Under cover dated March 8, 2016, the City of Crossville included with its application for permit renewal a request for permit modification. Crossville intends to expand its discharge capacity from 3.5 MGD to 5.0 MGD. To accomplish this Crossville proposes a discharge of up to 1.5 MGD of treated wastewater to the Caney Fork River at Highway 70. along with the possibility of a discharge of up to 0.5 MG to Beam Creek which is a tributary of the Caney Fork River. Alternatively to the Beam Creek discharge Crossville proposes land application of 0.5 MGD of treated effluent at the UT Experiment Station on Highway 70.

This permit does not propose any limits or conditions for these proposed discharges. The anti-degradation provisions of the state water quality standards have not been met, so the modification is not justified. More specifically, the social and economic justification and demonstration that the discharges will not result in pollution have not been established for the proposed stream segments. Modification of this permit during its term may occur once water quality determinations have been made for these receiving stream segments, degradation has been justified for area social and economic reasons and modeling demonstrates absence of reasonable potential to violate water quality standards in consideration of the low stream flows.

b. Compliance Schedule Summary

Description of Report to be Submitted	Reference Section in Permit
Monthly Discharge Monitoring Reports	1.3.1
Monthly Operational Reports	1.3.4
Monthly Bypass and Overflow Summary Report	1.3.5.1
Industrial Waste Survey Report within 120 days of the effective permit date	3.2.a
Technical review of the need to recalculate local limits within 120 days of the permit effective date	3.2.a
Biomonitoring Report beginning within 90 days of the effective permit date	3.4
Optimization Update, January 15 th of 2018 and 2019	3.7

c. For comparison, this rationale contains a table depicting the previous permit limits and effluent monitoring requirements in Appendix 1.

5. PREVIOUS PERMIT DISCHARGE MONITORING REPORT REVIEW

A review of the DMR summary from shows that for the 2-year period between September 2014 and September 2016, this facility has consistently complied with its permit limits. For the same reporting period, the system reported 18 collection system overflows. Of these, about 40% (7 of 18) were attributed to wet weather and the remaining 60% (11 of 18) were due to other causes.

A complete discharge monitoring report summary is located in Appendix 2.

6. PROPOSED EFFLUENT LIMITS AND RATIONALE

PARAMETERS	MONTHLY AVERAGE CONCENTRATION (MG/L)	MONTHLY AVERAGE AMOUNT (LB/DAY)	WEEKLY AVERAGE CONCENTRATION (MG/L)	WEEKLY AVERAGE AMOUNT (LB/DAY)	DAILY MAXIMUM CONCENTRATION (MG/L)	DAILY MINIMUM PERCENT REMOVAL	RATIONALE
CBOD ₅	10	292	15	438	20	40	D.O. protection, Refer to 6.1 below
NH ₃ -N (May 1- Oct. 31)	1.0	29.2	1.5	44	2.0	—	D.O. protection, Refer to 6.2 below
NH ₃ -N (Nov. 1- April 30)	1.75	51	2.6	76	3.5	—	D.O. protection, Refer to 6.2 below
Total Suspended Solids	30	876	40	1168	45	40	T.C.A. 0400-40-05-.09
Dissolved Oxygen (mg/l)	5.0 (daily minimum) instantaneous	—	—	—	—	—	D.O. protection, Refer to 6.1 below
Total Chlorine Residual (mg/l)	—	—	—	—	0.02 (daily maximum)	—	Refer to 6.3 below
Total Nitrogen	Report	Report	—	—	Report	Report	Refer to 6.4 below
Total Nitrogen	431.7 lb/d, Annual Rolling Average Load, through December 2018						Refer to 6.4 below
Total Nitrogen	76,169 Annual Rolling Total Load, from January 2019						Refer to 6.4 below
Total Phosphorous	Report	Report	—	—	Report	Report	Refer to 6.4 below
Total Phosphorous	47.7 lb/d, Annual Rolling Average Load, through December 2018						Refer to 6.4 below
Total Phosphorous	8,445 Annual Rolling Total Load, from January 2019						Refer to 6.4 below
<i>E. coli</i> (colonies/100ml)	126/100 ml	—	—	—	941/100 ml	—	T.C.A. 0400-40-03-.03, Refer to 6.5 below
Settleable Solids (ml/l)	—	—	—	—	1.0 (daily maximum)	—	T.C.A. 0400-40-05-.09
pH (standard units)	6.0-9.0	—	—	—	—	—	T.C.A. 0400-40-03-.03
Flow (MGD):							
Influent	Report	—	—	—	Report	—	Used to quantify pollutant load
Effluent	Report	—	—	—	Report	—	Used to quantify pollutant load
Whole Effluent Toxicity:							
IC ₂₅	100 % per sample	—	—	—	—	—	Refer to 6.6 below
Metals & Toxics:							Refer to 6.7 below
Sanitary Sewer Overflows, Total Occurrences	Report						Refer to 6.9 below
Dry Weather Overflows, Total Occurrences	Report						Refer to 6.9 below
Bypass of Treatment, Total Occurrences	Report						Refer to 6.9 below

Note: Weekly limitations on CBOD₅ and TSS concentrations are given as required per 40 CFR 133.102(a)(2) or 133.102(a)(4)(2) & 133.102 (b)(2) respectively; daily CBOD₅ and TSS limitations are authorized by T.C.A. 0400-40-05-.09; monthly and weekly mass loads are limited per 40 CFR 122.45(f) and based on the design flow as per 40 CFR 122.45(b); monthly average percent removal rates for CBOD₅ and TSS are required per 40 CFR 133.102(a)(3) or 133.102(a)(4)(iii) and 133.102 (b)(3) respectively. A minimum 40% daily removal rate is required as equivalent to a daily mass load limitation.

6.1. CBOD₅, DISSOLVED OXYGEN, AND PERCENT REMOVALS REQUIREMENTS

- a. Streeter-Phelps modeling was performed during a previous issuance of this permit at various conditions to determine allowable organic loadings. The monthly average limits for CBOD₅ (10 mg/l-year round), NH₃-N (1.0 mg/l-summer, 1.75 mg/l-winter), and D.O. (5.0 mg/l) still apply and are considered sufficient to result in an instream dissolved oxygen concentration that remains above the required minimum of 5.0 mg/l. Modeling results are located in the permit file administrative record.

In addition to CBOD₅, NH₃-N undergoes biological oxidation in a receiving stream thereby utilizing in stream oxygen and potentially reducing oxygen levels below water quality standards. Ammonia as N is also a pollutant that exhibits toxicity to fish and other aquatic life. The two affects are analyzed separately and the division imposes the most stringent limit in the permit.

- b. The treatment facility is required to remove 85% of the CBOD₅ and TSS that enter the facility on a monthly basis. This is part of the minimum requirement for all municipal treatment facilities contained in Code of Federal Regulations 40 Part 133.102. The reasons stated by the U.S.E.P.A. for these requirements are to achieve these two basic objectives:

- (1) To encourage municipalities to correct excessive inflow and infiltration (I/I) problems in their sanitary sewer systems, and
- (2) To help prevent intentional dilution of the influent wastewater as a means of meeting permit limits.

The treatment facility is required to remove 40% of the CBOD₅ and TSS that enter the facility on a daily basis. This percent removal will be calculated three times per week and recorded on the Monthly Operation Report. The number of excursions (days when CBOD₅ and/or TSS removal is less than 40%) will be reported on the Discharge Monitoring Report.

6.2. NH₃-N TOXICITY

To access toxicity impacts, the state utilizes the EPA document, 1999 Update to Ambient Water Quality Criteria for Ammonia, pursuant to 0400-40-03-.0-3(3)(j), and assumed stream temperatures of 27°C and 17°C and pH of 8.0 to derive an allowable instream protection value protective of chronic exposure to a continuous discharge. A mass balance equation with sewage treatment facility and stream flows and this allowable value determines the monthly average permit limit. The criteria document states that a 30Q5 flow value is protective in deriving allowable values. Where the division has 30Q5 flow values, the division may use them. Otherwise, the division utilizes the available 7Q10 or 1Q10 values that are generally more conservative. The criteria continuous concentrations (CCC) derived from assumed temperature and pH values are as follows:

CCC values based on temperature and pH, in mg/L:

Temperature (°C)	7.5 pH	8.0 pH	Temperature (°C)	7.5 pH	8.0 pH
25	2.22	1.24	15	4.22	2.36
27	1.94	1.09	17	3.72	2.07
30	1.61	0.90	20	3.06	1.71

The mass balance equation is as follows:

$$CCC = \frac{Q_S C_S + Q_{STP} C_{STP}}{Q_S + Q_{STP}} \quad \text{or,} \quad C_{STP} = \frac{CCC(Q_S + Q_{STP}) - (Q_S C_S)}{Q_{STP}}$$

where:

CCC = Criteria continuous concentration (mg/l)

Q_S = 7Q10 flow of receiving stream (MGD)

Q_{STP} = Design flow of STP (MGD)

C_S = Assumed/Measured instream NH_3 (mg/l)

C_{STP} = Allowable STP discharge of NH_3 (mg/l)

$$C_{STP} = \frac{1.09 (0 \text{ MGD} + 3.5 \text{ MGD}) - (0 \text{ MGD} \times 0.1 \text{ mg/l})}{3.5 \text{ MGD}} = 1.09 \text{ mg/l (summer)}$$

$$C_{STP} = \frac{2.07 (0 \text{ MGD} + 3.5 \text{ MGD}) - (0 \text{ MGD} \times 0.1 \text{ mg/l})}{3.5 \text{ MGD}} = 2.07 \text{ mg/l (winter)}$$

Because the $\text{NH}_3\text{-N}$ concentration limits calculated to protect dissolved oxygen are more restrictive than the toxicity limits calculated above, the monthly average limits for $\text{NH}_3\text{-N}$ (1.0 mg/l-summer, 1.75 mg/l-winter) are applied to the permit.

6.3. CHLORINATION

The residual chlorine limit is derived using the mass balance formula and the EPA instream protection value of 0.019 mg/l for fish and aquatic life. Applying this formula yields the following calculation:

$$\frac{0.019 (Q_d + Q_s)}{Q_d} = \text{Limit (mg/l)} = \frac{0.019(3.5 + 0)}{3.5} = 0.019 \text{ mg/l} \approx 0.02 \text{ mg/l}$$

where:

$$\begin{aligned} 0.019 &= \text{instream protection value (acute)} \\ 3.5 &= Q_d, \text{ design flow of STP (MGD)} \\ 0 &= Q_s, 7Q10 \text{ flow of receiving stream (MGD)} \end{aligned}$$

6.4. TOTAL NITROGEN AND TOTAL PHOSPHOROUS MONITORING/REPORTING

Since issue of this permit in 2011, the state has assessed the Obed River as having unavailable conditions for total phosphorus and total nitrogen. Additionally, the division has developed a state-wide nutrient reduction framework. Also, Crossville participated in the first-round of a nutrient optimization project undertaken by TDEC with assistance of a company doing business as The Water Plant Company. The nutrient conditions in this permit take all these factors into consideration.

Division biologists have been watching the stream for many years and had previously identified it as threatened by nutrients. This trend was confirmed during the division's 2014 assessment. Staff biologists report that over half of the macroinvertebrates in a 2012 sample were tolerant of elevated nutrient levels. On top of the plateau they report that 85% of the genera were representative of elevated nutrients. Even though the macroinvertebrate index score passed at river mile 33.4 (nearer to the STP outfall), the conclusion is that man-made impacts are contributing to near-field impacts on top of the plateau and continue far field to mile 20.8. This view was supported by a subsequent round of sampling that resulted in a barely-passing score at mile 20.8, but a badly failing score (TMI=14; 32 is passing) at mile 33.4 with algae visibly present.

Nutrients are naturally occurring and essential components of healthy aquatic systems. Excessive amounts of nutrients, however, can impact water quality. The division has therefore developed and begun to implement a strategy to accomplish long-term nutrient reduction in Tennessee waters. The document referred to as the Tennessee Nutrient Reduction Framework (NRF), contains proposed rationale and the methodology for implementing the strategy within a watershed area. Consequently, the framework considers impacts from both point and non-point sources of nutrients and potentially recommends reduction goals for both point and non-point sources. The NRF approach to nutrient reduction is intended to utilize an adaptive management approach in consideration of the facts presenting within a watershed and reevaluation of the effectiveness of progress being made. Regular reassessments of goals and action plans will be conducted by reviewing monitoring data, modeling results and other measures of success. As additional data becomes available (such as WWTP effluent characterization and instream water quality data), model results can be re-evaluated. The framework may be reviewed on the division's webpage at

<http://www.tn.gov/environment/article/wr-ws-tennessee-nutrient-reduction-framework>.

The SPARROW model is developed and supported by the United States Geological Survey (USGS) for regional watersheds in the nation. The term "SPARROW" refers to SPATIally Referenced Regressions On Watershed attributes, a model that relates in-stream water-quality data to spatially referenced characteristics of watersheds, including pollutant sources and transport factors. The SPARROW model performs a nonlinear least squares multiple regression on hydrologic elements to determine constituent load. The framework employs the concepts of an enrichment factor (EF) and aggregated WWTP loads to develop a decision making matrix of performance

levels for both total phosphorus and total nitrogen. The division calculates both the EF and percentage of wastewater contribution from the SPARROW model.

This approach sets realistic numeric percent reduction goals that result in the best possible conditions given available BMPs and other pollutant controls. To achieve the water quality requirement, the framework ultimately prescribes a reduction in pollutants discharged from point sources and the implementation of BMPs that mitigate or reduce the adverse effects of stressors on the stream's overall ecology.

The loadings from the SPARROW model are used to determine the enrichment factor. Atmospheric deposition load represents background for nitrogen and soil-parent rock (S-P R) load represents background for phosphorus. Enrichment factors for nitrogen and phosphorus were calculated for each HUC 10 watershed. The calculated EFs and percent WWTP contributions for HUC 10 watersheds were used to derive thresholds for a decision-making matrix to determine the appropriate level of treatment requirement from WWTPs.

Limit Development

SPARROW modeling conducted by the division for the Obed River Watershed (HUC 10: 06010208-03) projects that wastewater accounts for 6.4% of the nitrogen in the watershed and 17.8% of the phosphorus with enrichment factors for both scoring in the medium impact category. As a result, the suggested performance level for discharges is loads equivalent to 8 mg/L total nitrogen and 1 mg/L total phosphorus. The model suggests capping these loads annually at 76,169 lbs/year nitrogen and 8,455 lbs/year phosphorus based on these being equivalent to the current loads discharged at the average flow rate of 2.374 MGD used for the POTW in the model. These loads back-calculate to average concentrations of 7.15 mg/L total nitrogen and 0.8 mg/L total phosphorus at 3.5 MGD. However, it has already been determined that some optimization will be required to achieve these values as explained further below.

Load limits, versus concentration limits, give credit for any waste water diverted from the outfall for reuse and thereby encourages reuse alternatives. Annual rolling average load limits allow operational flexibility in achieving the load limits through optimization of biological removal. Biological treatment is capable of achieving nutrient removal and is preferred to chemical removal for a couple of reasons. Chemical addition to the treatment processes is potentially a source of added degradation to the receiving stream and biological removal has the capability of recovering energy thereby reducing the carbon footprint of the activity. Additionally, division water quality assessments have identified situations where wastewater treatment plant optimization can allow macro-invertebrate communities to achieve index scores that achieve eco-region goals.

In January 2015, Crossville participated in an optimization project coordinating by TDEC. It was agreed that optimization opportunities are currently limited. One of Crossville's two aeration tanks is full of solids. Until these solids are removed, there is little Crossville can do to optimize its operations. Additionally, optimization will require aeration tank mixers and piping modifications. It was determined that a

number of options exist to remove phosphorus once the solids are removed with the simplest way being to return approximately 10% of the waste activated sludge (WAS) to the aeration tank. This will capitalize on fermentative conditions in the WAS that grow the type organisms which will take in soluble phosphorus. Crossville intends to implement these findings which may significantly reduce the costs of some previously planned upgrades. The design of the optimization upgrades is being completed at this time. Crossville's design consultant projects the work will be advertised and bid in early 2017 with an anticipated completion date as early as Fall 2017.

The optimization project will include removal of the solids from the full aeration tank. Past efforts to remove these solids have demonstrated the potential to result in ammonia violations. Therefore, this permit proposes to initially set load limits for nitrogen and phosphorus as a 95th percentile of existing load data in conjunction with allowing a means of reporting upsets related to the optimization construction project on the discharge monitoring reports. The calculation of the capped load values is provided at the end of Section 6.4. These values will apply immediately as annual rolling average loads. Additionally, an optimization study is required in Section 3.7 of the permit to take place during 2018, after the construction project is complete. The object of this work is to see if the annual load values recommended by the SPARROW model can be achieved. The monitoring frequency for total nitrogen and total phosphorus will increase to weekly at the effective date of this permit. The recommended SPARROW limits are proposed to apply beginning in 2019 as rolling annual total loads. An interim report is due January 15th of 2018 and 2019 to summarize the optimization efforts in 2017 (construction) and 2018 (post construction).

This permit intentionally does not require chemical or biological sampling of the receiving stream in this permit. Chemical and/or biological sampling of several streams may be necessary of Crossville for the anti-degradation justification of the increased design flow rate it seeks. This permit intends to allow Crossville the flexibility needed to work with TDEC on the future discharge arrangements without arbitrarily dictating any deadlines for the planning and design.

DEFINITIONS/CONCEPTS

The "***nutrient reduction framework (NRF)***" refers to Tennessee's state-wide strategy aimed to effect a reduction in nutrient loads to streams from both point and non-point sources with the objective being to attain nutrient water quality goals in watersheds so that use support can be maintained.

The "***adaptive management approach***" is an iterative approach whereby the most practical treatment methods are prescribed for the symptoms and facts presenting followed by assessment of results and application of more stringent controls in subsequent control mechanisms. Control mechanisms may include permits, orders, agreements or any other legal arrangement allowable by law or regulation.

The "***enrichment factor (EF)***" is a representation of the estimated point source load contribution to the total HUC 10 watershed load. Is it the ratio of the estimated loads

from all source categories to the estimated load from categories of activities representing background conditions over which point sources have little or no control.

“Optimization” is the process of evaluating operational changes to processes and controls in order to achieve reductions in effluent loads. For nutrient reductions, optimization may include, but not be limited to, operational changes that are designed to enhance nitrification and phosphorus removal such as creation of anoxic zones, septage management practices, side stream management or by affecting modifications to processes or operations of industrial pretreatment waste streams.

Nutrient Load Calculations

00600 Nitrogen, total [as N] / Location 1 / Season 0 / Base				00665 Phosphorus, total [as P] / Location 1 / Season 0 / Base			
Limit Start	Limit End Date	Sample Type		Limit Start	Limit End Date	Sample Type	
2/1/2012	12/31/2016	COMPOS		2/1/2012	12/31/2016	COMPOS	
Limit	Limit Unit	Desc		Limit	Limit Unit	Desc	
	Pounds per Day	Milligrams per Liter			Pounds per Day	Milligrams per Liter	
Statistical Base	MO AVG	MO AVG		Statistical Base	MO AVG	MO AVG	
Limit Value				Limit Value			
DMR Value	C2	C3		DMR Value	C2	C3	
02/29/2012	101.9	9.4		02/29/2012	3.9	0.36	
03/31/2012	201	9		03/31/2012	9.4	0.42	
04/30/2012	107.5	7.9		04/30/2012	19.1	1.4	
05/31/2012	134.4	13		05/31/2012	28.9	2.5	
06/30/2012	191.9	11		06/30/2012	41.9	2.4	
07/31/2012	185.5	8.5		07/31/2012	26.2	1.2	
08/31/2012	225.3	12		08/31/2012	56.3	3	
09/30/2012	209.7	15		09/30/2012	43.3	3.1	
10/31/2012	210.3	11		10/31/2012	59.3	3.1	
11/30/2012	107.3	12		11/30/2012	17.9	2	
12/31/2012	171.4	8.6		12/31/2012	17.1	0.86	
01/31/2013	753.5	14		01/31/2013	41.4	0.77	
02/28/2013	283.8	10		02/28/2013	13.3	0.47	
03/31/2013	278.6	7.5		03/31/2013	11.5	0.31	
04/30/2013	647.9	8.6		04/30/2013	14.3	0.19	
05/31/2013	226.9	15		05/31/2013	21.2	1.4	
06/30/2013	224.8	11		06/30/2013	19.21	0.94	
07/31/2013	191.8	12		07/31/2013	27.1	1.7	
08/31/2013	208.4	9.2		08/31/2013	10.4	0.46	
09/30/2013	221.5	13		09/30/2013	18.7	1.1	
10/31/2013	394.7	15		10/31/2013	68.4	2.6	
11/30/2013	238	13		11/30/2013	21.9	1.2	
12/31/2013	506.7	10		12/31/2013	29.4	0.58	
01/31/2014	176	11		01/31/2014	10.57	0.66	
02/28/2014	215	10		02/28/2014	3.44	0.16	
03/31/2014	329.8	12		03/31/2014	4.9	0.18	
04/30/2014	267.4	7.2		04/30/2014	4.46	0.12	
05/31/2014	120	5.7		05/31/2014	10.3	0.49	
06/30/2014	87.7	5.3		06/30/2014	4.47	0.27	
07/31/2014	153	9.7		07/31/2014	3.9	0.25	
08/31/2014	133.1	9.4		08/31/2014	45.3	3.2	
09/30/2014	134.5	8.9		09/30/2014	33.3	2.2	
10/31/2014	196.6	11		10/31/2014	21.4	1.2	
11/30/2014	412.1	9		11/30/2014	45.8	1	
12/31/2014	487	13		12/31/2014	19.5	0.52	
01/31/2015	197	10		01/31/2015	8.7	0.44	
02/28/2015	266.8	12		02/28/2015	6.23	0.28	
03/31/2015	165.6	5.8		03/31/2015	4.57	0.16	
04/30/2015	105.4	3.1		04/30/2015	7.14	0.21	
05/31/2015	138.3	9.3		05/31/2015	8.48	0.57	
06/30/2015	133.4	8.8		06/30/2015	47	3.1	
07/31/2015	217.1	10.8		07/31/2015	24.1	1.2	
08/31/2015	124.8	8.4		08/31/2015	26.7	1.8	
09/30/2015	204.7	14.2		09/30/2015	31.3	2.17	
10/31/2015	224.8	14.3		10/31/2015	36.31	2.31	
11/30/2015	152.93	9.94		11/30/2015	21.85	1.42	
12/31/2015	197.83	8.28		12/31/2015	16.319	0.683	
01/31/2016	143.62	7.5		01/31/2016	12.715	0.664	
02/29/2016	205.5	7.96		02/29/2016	10.77	0.417	
03/31/2016	187.9	12.7		03/31/2016	11.54	0.78	
04/30/2016	177.5	11.8		04/30/2016	8.649	0.575	
05/31/2016	125.65	9.95		05/31/2016	8.625	0.683	
06/30/2016	244	16.5		06/30/2016	29.39	1.99	
07/31/2016	94.4	10.1		07/31/2016	11.68	1.25	
08/31/2016	204.3	15.6		08/31/2016	40.73	3.11	
09/30/2016	155.4	20.6		09/30/2016	30.17	4	
Avg	221.5	10.6		Avg	22.0	1.3	
Std Dev	127.8	3.1		Std Dev	15.7	1.0	
from pgs E-5 & E-6 in the TSD:				from pgs E-5 & E-6 in the TSD:			
$x_p = \mu + z_p \sigma$				$x_p = \mu + z_p \sigma$			
where:				where:			
μ = mean of monthly averages				μ = mean of monthly averages			
σ = standard deviation of monthly averages				σ = standard deviation of monthly averages			
z_p = pth percentage point for std normal dist				z_p = pth percentage point for std normal dist			
x_{95} = 95th %ile n-day monthly average limit				x_{95} = 95th %ile n-day monthly average limit			
$= \mu + 1.645\sigma$				$= \mu + 1.645\sigma$			
Note: $z_p = 1.645$				Note: $z_p = 1.645$			
x_{95} (mg/l) = 15.7				x_{95} (mg/l) = 2.1			
x_{95} (lb/day) = 431.7				x_{95} (lb/day) = 47.7			

6.5. E. COLI REQUIREMENTS

Disinfection of wastewater is required to protect the receiving stream from pathogenic microorganisms. Fecal coliform and *E. coli* are indicator organisms used as a measure of bacteriological health of a receiving stream and the effectiveness of disinfection.

As of September 30, 2004, the criterion for fecal coliform has been removed from the State's Water Quality Standards. Thus, the division imposes an *E. coli* limit on discharges of treated sewage for the protection of recreational use of the stream in lieu of the fecal coliform limit. The *E. coli* daily maximum limit of 487 colonies per 100 ml applies to lakes and exceptional Tennessee waters. A maximum daily limit of 941 colonies per 100 ml applies to all other recreational waters.

6.6. BIOMONITORING

The division evaluates all dischargers for reasonable potential to exceed the narrative water quality criterion, "no toxics in toxic amounts". The division has determined that for municipal facilities with stream dilutions of less than 500 to 1, any of the following conditions may demonstrate reasonable potential to exceed this criterion.

- a. Toxicity is suspected or demonstrated.
- b. A pretreatment program is required.
- c. The design capacity of the facility is greater than 1.0 MGD.

In cases where a discharger has characterized its effluent via toxicity test methods acceptable to the division, reasonable potential to exceed the criterion is evaluated using the following rationale.

The annual testing on both species reported LC₅₀ results >100%. Because the design capacity of the facility exceeds 1.0 MGD and a pretreatment program is required, the facility is considered to have the reasonable potential to violate the narrative water quality criterion, "no toxics in toxic amounts". Therefore, toxicity testing is required. This permit proposes to continue whole effluent toxicity testing since annual results for 4 years are required with each application for permit renewal.

The following calculation is the required dilution at which chronic toxicity testing must meet permit requirements.

$$IC_{25} \% = \frac{\text{Design Flow}}{\text{Low Flow} + \text{Design Flow}} * 100 \geq \frac{3.5}{0 + 3.5} * 100 > 100\%$$

where:

0 = Low Flow - 7Q10 (MGD)
3.5 = Design Flow Capacity (MGD)
IC₂₅ = Concentration causing 25% reduction in survival, reproduction and growth of test organisms

6.7. METALS AND TOXICS

Pass-through limitations for heavy metals and other toxic substances have been recalculated as part of the permit issuance process and/or due to changes in industrial waste contribution to the POTW. This POTW is required to implement/maintain a pretreatment program. More frequent monitoring will be required **in the permit** if (a) the reported concentrations approach or exceed calculated allowable values, (b) significant amounts of particular pollutants are present which may impact the treatment process sludge character or the receiving stream, or (c) minimum information is lacking to accurately calculate water quality protection values, in which case additional stream monitoring may also be required.

A summary of the application data, discharge monitoring report data, and semi-annual report data does not indicate that the potential exists for the water quality criteria for any parameter to be exceeded. The previous permit imposed monthly limits on Selenium and Silver based on values collected for these parameters in 2006. Monitoring and reporting during the current permit term (2011-2016) reveal that these metals are not detectable in most samples and that the 5 “hits” for each between 2012 and 2016 are below the calculated allowable effluent limitations. Therefore, this permit eliminates future monitoring and reporting of Selenium. Silver will continue to be monitored and reported in accordance with the industrial pretreatment program requirements in Part 3 of the permit. Appendix 3 lists the metal and toxic parameters calculations and the procedure used to derive the results.

6.8. VOLATILE ORGANIC, ACID-EXTRACTABLE, AND BASE-NEUTRAL COMPOUNDS

The division evaluated effluent concentrations of volatile organic, acid-extractable, and base-neutral compounds and antimony, arsenic, beryllium, selenium and thallium for potential to violate water quality criteria using the following mass balance equation:

$$C_m = \frac{Q_s C_s + Q_w C_w}{Q_s + Q_w}$$

where:

Cm = resulting in-stream concentration after mixing
Cw = concentration of pollutant in wastewater
Cs = stream background concentration
Qw = wastewater flow, (STP design flow)
Qs = stream low flow

to protect water quality:

$$C_w \leq C_a$$

where:

$$\begin{aligned} C_a &= \text{STP effluent concentration allowable} \\ &= \frac{(S_A) [C_m (Q_s + Q_w) - Q_s C_s]}{Q_w} \end{aligned}$$

and (S_A) = the percent "Stream Allocation".

The reasonable potential evaluation uses the following assumptions and procedures:

- a. Stream background concentrations, C_s , for all volatile organic, acid-extractable, and base-neutral compounds equal zero unless actual stream data exists to show otherwise. Use of the effluent concentrations of such pollutants contributed by upstream dischargers as background is not justifiable due to the volatility and reactivity of these pollutants.
- b. The stream allocation, S_A , is 90% and is used as a factor of safety.
- c. A mass balance uses the STP design flow, the receiving stream critical low flow (7Q10 or 1Q10), the state water quality numeric criteria, and the stream allocation safety factor to derive the allowable effluent concentrations.
- d. When pollutants have potential to violate standards because the concentrations are below the scan detection levels but could be above the allowable water quality based effluent concentrations, the pollutants are handled one of three (3) ways:
 - i. Additional testing of detected and non-detected pollutants is required if contributing industrial processes are likely to contain them and the effluent scans have not met the minimum required detection levels (RDL) in the state water quality standards or approximated the method detection limits (MDL) of the approved test methods for the pollutants in 40 CFR Part 136.
 - ii. If the required RDL has been used and resulted in non-detection, or if an MDL has been used with non-detection and the contributing industrial processes do not reasonably contain that pollutant, the division drops the pollutant from further consideration.
 - iii. Pollutants detected at levels high enough to violate standards are limited in the permit to the allowable concentration, C_w , based on STP design flow.

Calculations for this permit have been done using a standardized spreadsheet, titled "WQ Based Effluent Calculations- Other Compounds", and are located in Appendix 4. All metals other than antimony, arsenic, beryllium, selenium, and thallium have been evaluated using procedures described in the rationale, or fact sheet, section headed, "METALS & TOXICS".

The evaluation indicates that volatile organic, acid extractable, and base neutral compounds and antimony, arsenic, beryllium, selenium, and thallium do not exhibit the potential to violate water quality criteria and thus will not be given effluent limitations and monitoring requirements in the permit.

6.9. OVERFLOW AND BYPASS REPORTING

For the purposes of demonstrating proper operation of the collection, transmission, and treatment system, the permit defines overflow as any release of sewage other than through permitted outfalls. This definition includes, but is not necessarily limited to, sanitary sewer overflows and dry weather overflows as defined. For example, a collection system blockage or hydraulic overload that causes backup and release of sewage into a building during a wet weather event may not clearly fit either the definition of a sanitary sewer overflow or a dry weather overflow. Still, any unpermitted release potentially warrants permittee mitigation of human health and/or water quality impacts via direct or indirect contact and demonstrates a hydraulic problem in the system that warrants permittee consideration as part of proper operation and maintenance of the system.

However, for the more typical, unpermitted, releases into the environment, this permit intends interchangeable use of the terms, "overflow" and "sanitary sewer overflow" for compliance reporting purposes.

7. OTHER PERMIT REQUIREMENTS AND CONDITIONS

7.1. CERTIFIED WASTEWATER TREATMENT OPERATOR

The waste treatment facilities shall be operated under the supervision of a Grade 4 certified wastewater treatment operator in accordance with the Water Environmental Health Act of 1984. Operator grades are under jurisdiction of the Water and Wastewater Operators Certification Board. This NPDES permit is under jurisdiction of the Tennessee Board of Water Quality, Oil and Gas. Operator grades are rated and recommended by the Division of Water Resources pursuant to Rule 0400-49-01 (formerly 1200-05-03) and are included in this fact sheet for reference. The grades are intentionally not specified in the permit so that the operation certification board can authorize changes in grade without conflicting with this permit.

7.2. COLLECTION SYSTEM CERTIFIED OPERATOR

The collection system shall be operated under the supervision of a Grade I certified collection system operator in accordance with the Water Environmental Health Act of 1984.

7.3. PRETREATMENT PROGRAM

The City of Crossville has an approved pretreatment program. An updated Industrial Waste Survey must be completed within 120 days of the effective date of the permit, unless such a survey has been submitted within 3 years of the effective date.

At least once each reporting period, all permittees with approved pretreatment programs are required to analyze the STP influent and effluent for the following pollutant parameters: chromium (trivalent and hexavalent and total if drinking water use applies), copper, lead, nickel, zinc, silver, cadmium, mercury, total phenols, and cyanide. These pollutants were selected because, historically, they are the ones that tend to be predominant in industrial wastewaters. Other pollutants may be added to the list, as required.

During preparation of this permit, data from ten previous semiannual reports were analyzed. If any particular value of a pollutant equals or exceeds 85% of the pass-through limit, the pollutant was added to the list of those that are required to be sampled. Based on our review of the semiannual reports, sampling for additional pollutants is not required at this time. A summary of the SAR data follows:

	PTL 9/19/2009	85% PTL	PTL 11/7/2016	Apr-16	Oct-15	Apr-15	Oct-14	Apr-14	Oct-13	Apr-13	Oct-12	Apr-12	Oct-11
TN 0024996													
COPPER	0.02612	0.02134	0.02510	0.00210	0.00172	0.00140	0.00150	0.00160	0.01500	0.00220	0.00210	0.00260	0.00100
CHROMIUM, III	0.06000	0.30379	0.35740	0.01000	0.01000	0.01000	0.01000	0.01000	0.01000	0.01000	0.01000	0.01000	0.01000
CHROMIUM, VI	0.01100	0.00935	0.01100	0.01000	0.01000	0.01000	0.01000	0.01000	0.01000	0.01000	0.01000	0.01000	0.01000
CHROMIUM, TOTAL	n/a	n/a	n/a	0.00100	0.00100	0.00100	0.00100	0.00100	0.00140	0.00100	0.00110	0.00100	0.01000
NICKEL	0.12192	0.09965	0.11724	0.00174	0.00189	0.00100	0.00200	0.00140	0.00160	0.00200	0.00430	0.00100	0.00100
CADMIUM	0.00099	0.00081	0.00095	0.00100	0.00100	0.00100	0.00050	0.00050	0.00050	0.00050	0.00050	0.00100	0.00100
LEAD	0.01392	0.01125	0.01324	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100
MERCURY	0.00005	0.0000425	0.00005	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020
SILVER	0.00331	0.00259	0.00305	0.00100	0.00100	0.00100	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050
ZINC	0.20000	0.17000	0.20000	0.10200	0.07820	0.01000	0.15000	0.09400	0.11000	0.10000	0.04600	0.04300	0.01000
CYANIDE	0.00520	0.00442	0.00520	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500
TOLUENE	0.01500	0.01275	0.01500										0.00500
BENZENE	0.00300	0.00255	0.00300										0.00100
1,1,1 TRICHLOROETHANE	0.03000	0.02550	0.03000										0.00100
ETHYLBENZENE	0.00400	0.00340	0.00400										0.00100
CARBON TETRACHLORIDE	0.01500	0.01275	0.01500										0.00100
CHLOROFORM	0.08500	0.07225	0.08500										0.00500
TETRACHLOROETHYLENE	0.02500	0.02125	0.02500										0.00100
TRICHLOROETHYLENE	0.01000	0.00850	0.01000										0.00100
1,2 TRANS-DICHLOROETHYLENE	0.00150	0.00128	0.00150										0.00100
METHYLENE CHLORIDE	0.05000	0.04250	0.05000										0.00500
TOTAL PHENOLS	0.05000	0.04250	0.05000	0.04000	0.04000	0.04000	0.04000	0.04000	0.04000	0.04000	0.04000	0.04000	0.04000
NAPHTHALENE	0.00100	0.00085	0.00100										0.00100
TOTAL PHTHALATES	0.06450	0.05483	0.06450										0.00100
Bolted in effluent data exceeds 85% of proposed PTLs													
Shaded means detection level													

7.4. BIOSOLIDS/SLUDGE MANAGEMENT

The Clean Water Act (CWA) requires that any NPDES permit issued to a publicly owned treatment works or any other treatment works treating domestic sewage shall comply with 40 CFR Part 503, the federal regulation governing the use and disposal of sewage sludge. It is important to note that "biosolids" are sewage sludge that has been treated to a level so that they can be land applied.

The language in subpart 3.3 of the permit, relative to biosolids management, a CWA requirement, allows the “permitting authority” under 40 CFR Part 503.9(p) to be able to enforce the provisions of Part 503. The “permitting authority” relative to Part 503 is either a state that has been delegated biosolids management authority or the applicable EPA Region; in the case of Tennessee it is EPA-Region 4.

Tennessee regulates the land application of biosolids under state rules, Chapter 0400-40-15. The state rules became effective on June 30, 2013. Under these state rules, all facilities that land apply biosolids must obtain a biosolids permit from the division. The land application of biosolids under state rules will be regulated through either a general permit or by an individual permit. It is anticipated that the permitting of biosolids land application will begin near the beginning of calendar year 2014. Questions about the division’s biosolids regulations and permitting program should be directed to the division’s Biosolids Coordinator at:

State of Tennessee
Department of Environment and Conservation
Division of Water Resources
William R. Snodgrass - Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor
Nashville, Tennessee 37243-1102
(615) 532-0625

7.5. PERMIT TERM

This permit is being reissued to coordinate its reissuance with other permits located within the Emory Watershed (set to expire in 2021).

7.6. ELECTRONIC REPORTING

Starting on December 21, 2016, all Individual NPDES Permit holders will be required to submit Discharge Monitoring Reports (DMRs) electronically through NetDMR. Prior to 21 December 2016, the permittee may elect to electronically submit DMRs instead of mailing paper DMRs.

EPA published the National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule, which will modernize Clean Water Act reporting for municipalities, industries and other facilities. The rule was published in the Federal Register on October 22, 2015 and became effective on December 22, 2015. The rule replaces most paper-based NPDES reporting requirements with electronic reporting.

More information is available at: <http://www.tn.gov/environment/article/wr-netdmr-electronic-reporting>:

Crossville has completed its NetDMR subscriber agreement and was set up to begin electronic DMR reporting beginning with the May 2016 reporting period (DMR due June 15, 2016).

8. ANTIDegradation Statement/Water Quality Status

Tennessee's Antidegradation Statement is found in the Rules of the Tennessee Department of Environment and Conservation, Chapter 0400-40-03-.06. It is the purpose of Tennessee's standards to fully protect existing uses of all surface waters as established under the Act.

Stream determinations for this permit action are associated with the waterbody segment identified by the division as segment ID# TN6020108013_1000.

The Department has made a determination of the receiving waters associated with the subject discharge(s) and has found the receiving stream to be an available conditions water. Additionally, this water is fully supporting of its designated uses. The Department has maintained, and shall continue to assess, the water quality of the stream to assure that the water quality is adequate to protect the existing uses of the stream fully, and to assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control.

The division has made a water quality assessment of the receiving waters associated with the subject discharge(s) and has found the receiving stream to be neither an exceptional nor outstanding national resource water. Additionally, the division assesses this water quality in the receiving stream segment to not support the fish and aquatic life use due to total phosphorus and nitrate plus nitrite from municipal separate storm sewer system and municipal point source discharges. This permit proposes load limits on total phosphorus and total nitrogen to cap the discharge at its existing loads and includes nutrient optimization conditions. Refer back to Section 6.4 for additional detail.

No TMDLs have been developed and approved for this waterbody segment.

APPENDIX 1 PREVIOUS PERMIT LIMITS

PARAMETERS	MONTHLY AVERAGE CONCENTRATION (MG/L)	MONTHLY AVERAGE AMOUNT (LB/DAY)	WEEKLY AVERAGE CONCENTRATION (MG/L)	WEEKLY AVERAGE AMOUNT (LB/DAY)	DAILY MAXIMUM CONCENTRATION (MG/L)	DAILY MIN.% OR MAX. AMT.	MEASUREMENT FREQUENCY
CBOD ₅	10	292	15	438	20	40%	Weekly
NH ₃ -N (May 1- Oct. 31)	1	29.2	1.5	44	2	—	Weekly
NH ₃ -N (Nov. 1- April 30)	1.75	51	2.6	76	3.5	—	Weekly
Total Suspended Solids	30	876	40	1168	45	40%	3/week
Dissolved Oxygen (mg/l)	5.0 (daily minimum) instantaneous	—	—	—	—	—	5/week
Total Chlorine Residual (mg/l)*	—	—	—	—	0.02 (daily maximum)	—	5/week
Total Nitrogen	—	—	—	—	Report (qtr avg)	Report (qtr load)	Monthly
Total Phosphorous	—	—	—	—	Report (qtr avg)	Report (qtr load)	Monthly
<i>E. coli</i> (colonies/100ml)	126/100 ml	—	—	—	941/100 ml	—	3/week
Settleable Solids (ml/l)	—	—	—	—	1.0 (daily maximum)	—	Weekly
pH (standard units)	6.0-9.0	—	—	—	—	—	5/week
Flow (MGD):							
Influent	Report	—	—	—	Report	—	Daily
Effluent	Report	—	—	—	Report	—	Daily
Conductivity (uMHOs/cm)	Report				Report	—	Weekly
Whole Effluent Toxicity:							
IC ₂₅	100% per sample	—	—	—	—	—	Annually
Metals & Toxics:							
Ag, Total	0.0033	0.100			0.0033	0.100 (lb/d)	Weekly
Se, Total	0.005	0.15			0.020	0.6 (lb/d)	Weekly
Sanitary Sewer Overflows, Total Occurrences					Report		Continuous
Dry Weather Overflows, Total Occurrences					Report		Continuous
Bypass of Treatment, Total Occurrences					Report		Continuous

APPENDIX 2

Discharge Monitoring Report Summary

	Flow (MGD)		CBiochemical Oxygen Demand				Suspended Solids				Effluent (mg/l)										Bypass & Overflow
			Influent (mg/l)	Effluent (mg/l)		%	Influent (mg/l)	Effluent (mg/l)		%	Settleable Solids (ml/l)	pH		Con- ductivity	Ammonia		D.O. Min	E. coli			
	Monthly Average	Daily Max		Monthly Average	Daily Max			Removal	Monthly Average			Daily Max	Removal		Min	Max		Monthly Average	Daily Max		
Limits	Report	Report	Report			85	Report			85	1.0	6.0	9.0				5.0	126	941		
Summer				10	20			30	45					Rpt	1.0	2.0					
Winter				10	20			30	45					Rpt	1.8	3.5					
Average	2.289	3.838	234	3	5	98	538.5	8	17	98	0.1	7.3	7.7	517	0.7	1.4	7.1	23	165		
Maximum	3.199	7.591	499	6	9	100	1123.0	15	27	99	0.2	7.6	7.8	752	1.5	4.0	9.0	110	437		
Minimum	1.037	1.384	78	2	3	95	210.0	4	8	95	0.1	6.7	7.1	376	0.2	0.3	5.6	3	20		
+ = Exceedence															1					18	
Date																					
Sep/14	1.849	3.594	207	3	7	98.3	522	4	9	99.3		7.2	7.7	575	0.31	0.90	6.3	3	103		
Oct/14	2.950	7.591	128	3	5	97.7	276	6	15	97.7		7.4	7.8	498	0.78	1.50	6.8	8	109	1	
Nov/14	2.675	5.491	109	3	4	97.6	240	5	11	98		7.1	7.7	485	0.85	2.10	7.9	9	70	1	
Dec/14	3.182	6.114	113	3	4	97.2	226	4	11	98.2		6.9	7.6	420	0.39	0.60	7.8	13	81	1	
Jan/15	2.848	4.403	78	4	5	95.3	210	7	12	96.7		6.7	7.1	419	1.05	1.40	9.0	10	41	1	
Feb/15	2.771	4.478	106	5	8	95	231	11	23	95.2		6.7	7.2	492	1.07	1.60	8.7	17	116		
Mar/15	3.199	4.909	171	6	9	96.6	331	11	27	96.7		7.0	7.7	559	1.34	2.00	8.5	32	260	1	
Apr/15	3.004	4.077	137	3	5	97.6	301	8	16	97.3		7.3	7.6	416	1.48	2.20	7.9	25	345		
May/15	1.732	2.619	260	3	3	98.9	561	5	8	99.1		7.4	7.6	550	0.39	1.00	7.2	5	46		
Jun/15	1.852	2.944	369	3	4	99.1	931	8	22	99.1		7.5	7.7	584	0.53	1.10	6.3	52	411		
Jul/15	2.939	4.387	196	3	5	98.6	354	5	10	98.6	0.1	7.3	7.7	453	0.34	0.60	6.6	43	225	1	
Aug/15	2.264	3.596	234	2	3	99.2	543	7	20	98.7	0.1	7.5	7.8	557	0.29	0.80	6.8	19	210	1	
Sep/15	2.086	3.334	343	2	3	99.5	710	6	16	99.2	0.1	7.5	7.8	608	0.46	1.50	6.9	3	32		
Oct/15	2.186	3.387	173	3	4	98.5	330	7	10	97.9	0.1	7.5	7.8	581	0.43	1.50	7.3	5	20		
Nov/15	2.298	3.559	187	2	3	98.7	392	8	18	98	0.1	7.3	7.7	538	0.45	4.00 +	7.4	5	83	1	
Dec/15	3.016	3.550	168	4	5	97.8	371	13	25	96.6	0.1	7.3	7.6	376	1.08	1.50	7.3	38	178		
Jan/16	2.591	3.614	239	4	5	98.4	455	10	19	97.7	0.1	7.4	7.6	456	1.10	1.50	8.1	21	189		
Feb/16	2.974	3.580	216	6	9	97.4	520	15	23	97.1	0.1	7.3	7.6	420	1.16	1.50	7.6	75	206	1	
Mar/16	1.800	3.125	221	4	6	98	311	10	14	96.8	0.1	7.4	7.6	630	0.50	1.10	7.9	12	56	2	
Apr/16	2.116	5.877	278	3	3	99	924	8	13	99.2	0.1	7.4	7.7	592	1.02	1.30	7.0	7	40		
May/16	1.424	2.192	342	3	4	99.2	811	10	16	98.8	0.1	7.5	7.7	547	0.95	1.40	5.7	12	70	2	
Jun/16	1.474	2.502	277	4	5	98.7	899	12	25	98.7	0.1	7.5	7.7	443	0.87	1.50	5.6	19	435		
Jul/16	1.541	2.788	391	3	4	99.2	946	8	16	99.1	0.1	7.5	7.8	399	0.70	1.10	5.7	110	298	1	
Aug/16	1.408	2.863	499	4	4	99.3	1123	12	26	98.9	0.2	7.6	7.8	570	0.86	1.40	5.6	35	437	1	
Sep/16	1.037	1.384	397	2	3	99.6	944	10	22	98.9	0.1	7.4	7.8	752	0.18	0.30	5.9	6	71	3	
Oct/16																					

APPENDIX 3

Metal and Toxic Parameter Calculations

The following procedure is used to calculate the allowable instream concentrations for pass-through guidelines and permit limitations. A spreadsheet of these calculations follows this narrative.

- a. The most recent background conditions of the receiving stream segment are compiled. This information includes:
 - * 7Q10 of receiving stream (0 MGD, USGS)
 - * Calcium hardness (97mg/l, ambient)
 - * Total suspended solids (10 mg/l, default)
 - * Background metals concentrations (½ water quality criteria)
 - * Other dischargers impacting this segment (none)
 - * Downstream water supplies, if applicable
- b. The chronic water quality criteria are converted from total recoverable metal at lab conditions to dissolved lab conditions for the following metals: cadmium, copper, trivalent chromium, lead, nickel and zinc. Then translators are used to convert the dissolved lab conditions to total recoverable metal at ambient conditions.
- c. The acute water quality criteria are converted from total recoverable metal at lab conditions to dissolved lab conditions for the following metals: cadmium, copper, trivalent chromium, lead, nickel, zinc and silver. Then translators are used to convert the dissolved lab conditions to total recoverable metal at ambient conditions for the following metals: cadmium, copper, lead, nickel and silver.
- d. The resulting allowable trivalent and hexavalent chromium concentrations are compared with the effluent values characterized as total chromium on permit applications. If reported total chromium exceeds an allowable trivalent or hexavalent chromium value, then the calculated value will be applied in the permit for that form of chromium unless additional effluent characterization is received to demonstrate reasonable potential does not exist to violate the applicable state water quality criteria for chromium.
- e. A standard mass balance equation determines the total allowable concentration (permit limit) for each pollutant. This equation also includes a percent stream allocation of no more than 90%.

The following formulas are used to evaluate water quality protection:

$$C_m = \frac{Q_s C_s + Q_w C_w}{Q_s + Q_w}$$

where:

Cm = resulting in-stream concentration after mixing
Cw = concentration of pollutant in wastewater
Cs = stream background concentration
Qw = wastewater flow
Qs = stream low flow

to protect water quality:

$$C_w \leq \frac{(S_A) [C_m (Q_s + Q_w) - Q_s C_s]}{Q_w}$$

where (S_A) is the percent "Stream Allocation".

Calculations for this permit have been done using a standardized spreadsheet, titled "Water Quality Based Effluent Calculations." Division policy dictates the following procedures in establishing these permit limits:

1. The critical low flow values are determined using USGS data:

Fish and Aquatic Life Protection

7Q10 - Low flow under natural conditions

1Q10 - Regulated low flow conditions

Other than Fish and Aquatic Life Protection

30Q2 - Low flow under natural conditions

2. Fish & Aquatic Life water quality criteria for certain Metals are developed through application of hardness dependent equations. These criteria are combined with dissolved fraction methodologies in order to formulate the final effluent concentrations.
3. For criteria that are hardness dependent, chronic and acute concentrations are based on a Hardness of 25 mg/L and Total Suspended Solids (TSS) of 10 mg/L unless STORET or Water Supply intake data substantiate a different value. Minimum and maximum limits on the hardness value used for water quality calculations are 25 mg/L and 400 mg/L respectively. The minimum limit on the TSS value used for water quality calculations is 10 mg/L.
4. Background concentrations are determined from the division database, results of sampling obtained from the permittee, and/or obtained from nearby stream sampling data. If this background data is not sufficient, one-half of the chronic "In-stream Allowable" water quality criteria for fish and aquatic life is used. If the measured background concentration is greater than the chronic "In-stream Allowable" water quality criteria, then the measured background concentration is used in lieu of the chronic "In-stream Allowable" water quality criteria for the purpose of calculating the appropriate effluent limitation (C_w). Under these circumstances, and in the event the "stream allocation" is less than 100%, the calculated chronic effluent limitation for fish and aquatic life should be equal to the chronic "In-stream Allowable" water quality criteria. These guidelines should be strictly followed where the industrial source water is not the receiving stream.

Where the industrial source water is the receiving stream, and the measured background concentration is greater than the chronic "In-stream Allowable" water quality criteria, consideration may be given as to the degree to which the permittee should be required to meet the requirements of the water quality criteria in view of the nature and characteristics of the receiving stream.

The spreadsheet has fifteen (15) data columns, all of which may not be applicable to any particular characteristic constituent of the discharge. A description of each column is as follows:

Column 1: The "Stream Background" concentrations of the effluent characteristics.

Column 2: The "Chronic" Fish and Aquatic Life Water Quality criteria. For cadmium, copper, trivalent chromium, lead, nickel, and zinc, this value represents the criteria for the dissolved form at laboratory conditions. The Criteria Continuous Concentration (CCC) is calculated using the equation:

$$CCC = (\exp \{ m_C [\ln (\text{stream hardness})] + b_C \}) (CCF)$$

CCF = Chronic Conversion Factor

This equation and the appropriate coefficients for each metal are from Tennessee Rule 0400-40-03-.03 and the EPA guidance contained in *The Metals Translator: Guidance For Calculating A Total Recoverable Permit Limit From a Dissolved Criterion* (EPA 823-B-96-007, June 1996). Values for other metals are in the total form and are not hardness dependent; no chronic criterion exists for silver. Published criteria are used for non-metal parameters.

Column 3: The "Acute" Fish and Aquatic Life Water Quality criteria. For cadmium, copper, trivalent chromium, lead, nickel, silver, and zinc, this value represents the criteria for the dissolved form at laboratory conditions. The Criteria Maximum Concentration (CMC) is calculated using the equation:

$$CMC = (\exp \{ m_A [\ln (\text{stream hardness})] + b_A \}) (ACF)$$

ACF = Acute Conversion Factor

This equation and the appropriate coefficients for each metal are from Tennessee Rule 0400-40-03-.03 and the EPA guidance contained in *The Metals Translator: Guidance For Calculating A Total Recoverable Permit Limit From a Dissolved Criterion* (EPA 823-B-96-007, June 1996). Values for other metals are in the total form and are not hardness dependent. Published criteria are used for non-metal parameters.

Column 4: The "Fraction Dissolved" converts the value for dissolved metal at laboratory conditions (columns 2 & 3) to total recoverable metal at in-stream ambient conditions (columns 5 & 6). This factor is calculated

using the linear partition coefficients found in *The Metals Translator: Guidance For Calculating A Total Recoverable Permit Limit From a Dissolved Criterion* (EPA 823-B-96-007, June 1996) and the equation:

$$\frac{C_{\text{diss}}}{C_{\text{total}}} = \frac{1}{1 + \{ [K_{\text{po}}] [\text{ss}]^{(1+a)} [10^{-6}] \}}$$

ss = in-stream suspended solids concentration [mg/l]

Linear partition coefficients for streams are used for unregulated (7Q10) receiving waters, and linear partition coefficients for lakes are used for regulated (1Q10) receiving waters. For those parameters not in the dissolved form in columns 2 & 3 (and all non-metal parameters), a Translator of 1 is used.

- Column 5:** The "Chronic" Fish and Aquatic Life Water Quality criteria at in-stream ambient conditions. This criteria is calculated by dividing the value in column 2 by the value in column 4.
- Column 6:** The "Acute" Fish and Aquatic Life Water Quality criteria at in-stream ambient conditions. This criteria is calculated by dividing the value in column 3 by the value in column 4.
- Column 7:** The "Chronic" Calculated Effluent Concentration for the protection of fish and aquatic life. This is the chronic limit.
- Column 8:** The "Acute" Calculated Effluent Concentration for the protection of fish and aquatic life. This is the acute limit.
- Column 9:** The In-Stream Water Quality criteria for the protection of Human Health associated with the stream use classification of Organism Consumption (Recreation).
- Column 10:** The In-Stream Water Quality criteria for the protection of Human Health associated with the stream use classification of Water and Organism Consumption. These criteria are only to be applied when the stream use classification for the receiving stream includes both "Recreation" and "Domestic Water Supply."
- Column 11:** The In-Stream Water Quality criteria for the protection of Human Health associated with the stream use classification of Domestic Water Supply.
- Column 12:** The Calculated Effluent Concentration associated with Organism Consumption.
- Column 13:** The Calculated Effluent Concentration associated with Water and Organism Consumption.

Column 14: The Calculated Effluent Concentration associated with Domestic Water Supply.

Column 15: The Effluent Limited criteria. This upper level of allowable pollutant loading is established if (a) the calculated water quality value is greater than accepted removal efficiency values, (b) the treatment facility is properly operated, and (c) full compliance with the pretreatment program is demonstrated. This upper level limit is based upon EPA's 40 POTW Survey on levels of metals that should be discharged from a POTW with a properly enforced pretreatment program and considering normal coincidental removals.

The most stringent water quality effluent concentration from Columns 7, 8, 12, 13, 14, and 15 is applied if the receiving stream is designated for domestic water supply. Otherwise, the most stringent effluent concentration is chosen from columns 7, 8, 12, and 15 only.

Appendix 3 Continued - WQ Based Effluent Calculations

2013 WQC

PASS-THROUGH LIMITATIONS FOR METALS AND OTHER TOXIC SUBSTANCES
WATER QUALITY BASED EFFLUENT CALCULATIONS
OUTFALL 001

FACILITY:
City of Crossville

PERMIT #:
TN0024996

DATE:
11/3/2016

CALC BY:
MTS

non-regulated stream worksheet (7Q10)

Stream (7Q10)	Stream (30Q5)	Waste Flow (MGD)	Ttl. Susp. Solids (mg/l)	Hardness (as CaCO3) (mg/l)	Margin of Safety (%)
0.00	0.00	3.5	10	97	100

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Stream	Fish/Aqua. Life (F & AL) WQC			F & AL- instream allowable		Calc. Effluent Concentration		Human Health Water Quality Criteria *						effluent limited case
Bckgrnd.	lab conditions		Fraction	ambient conditions (Tot)		based on F & AL		In-Stream Criteria			Calc. Effluent Concentration **			
Conc.	Chronic	Acute	Dissolved	Chronic	Acute	Chronic	Acute	Organisms	Water/Organisms	DWS	Organisms	Water/Organisms	DWS	ug/l
PARAMETER	[ug/l]	[ug/l]	[Fraction]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	PARAMETER
Copper (a,b)	12.551	8.726	13.059	0.348	25.103	37.569	25.10	37.57	N/A	N/A	N/A	N/A	N/A	80.0
Chromium III	178.698	72.289	555.726	0.202	357.396	2747.521	357.40	2747.52	N/A	N/A	N/A	N/A	N/A	Chromium III
Chromium VI	5.500	11.000	16.000	1.000	11.000	16.000	11.00	16.00	N/A	N/A	N/A	N/A	N/A	Chromium VI
Chromium, Total		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	100.0	N/A	N/A	100.00	60.0
Nickel (a,b)	58.618	50.684	456.324	0.432	117.236	1055.521	117.24	1055.52	4600.0	610.0	100.0	4600.00	610.00	180.0
Cadmium (a,b)	0.477	0.241	1.955	0.252	0.954	7.743	0.95	7.74	N/A	N/A	5.0	N/A	N/A	5.0
Lead (a,b)	6.619	2.435	62.474	0.184	13.238	339.714	13.24	339.71	N/A	N/A	5.0	N/A	N/A	45.0
Mercury (T) (c,e)	0.006	0.770	1.400	1.000	0.770	1.400	0.77	1.40	0.051	0.05	2.0	0.05	0.05	0.4
Silver (a,b,f)	1.526	N/A	3.053	1.000	N/A	3.053	N/A	3.05	N/A	N/A	N/A	N/A	N/A	5.0
Zinc (a,b)	199.884	115.129	114.195	0.288	399.768	396.525	399.77	396.52	26000.0	7400.0	N/A	26000.00	7400.00	200.0
Cyanide (d)	2.600	5.200	22.000	1.000	5.200	22.000	5.20	22.00	140.0	140.0	200.0	140.00	140.00	230.0
Toluene	0.000								15000.0	1300.0	1000.0	15000.00	1300.00	15.0
Benzene	0.000								510.0	22.0	5.0	510.00	22.00	3.0
1,1,1 Trichloroethane	0.000								N/A	N/A	200.0	N/A	N/A	30.0
Ethylbenzene	0.000								2100.0	530.0	700.0	2100.00	530.00	4.0
Carbon Tetrachloride	0.000								16.0	2.3	5.0	16.00	2.30	15.0
Chloroform	0.000								4700.0	57.0	N/A	4700.00	57.00	85.0
Tetrachloroethylene	0.000								33.0	6.9	5.0	33.00	6.90	25.0
Trichloroethylene	0.000								300.0	25.0	5.0	300.00	25.00	10.0
1,2 trans Dichloroethylene	0.000								10000.0	140.0	100.0	N/A	140.00	1.5
Methylene Chloride	0.000								5900.0	46.0	N/A	5900.00	46.00	50.0
Total Phenols	0.000								860000.0	10000.0	N/A	860000.00	10000.00	50.0
Naphthalene	0.000								N/A	N/A	N/A	N/A	N/A	1.0
Total Phthalates	0.000								N/A	N/A	N/A	N/A	N/A	64.5
Chlorine (T. Res.)	5.500	11.000	19.000	1.000	11.000	19.000	11.00	19.00	N/A	N/A	N/A	N/A	N/A	N/A

a Denotes metals for which Fish & Aquatic Life Criteria are expressed as a function of total hardness.

b The criteria for this metal is in the dissolved form at lab conditions. The calculated effluent concentration is in the total recoverable form.

c The chronic criteria for mercury is not converted to dissolved, since it is based on fish tissue data rather than toxicity.

d The criteria for this parameter is in the total form.

e Previously, the Division established that 0.006 ug/L would be maximum background default if no sample data available or if all samples were <RDL (<0.2 ug/L), based on reference stream monitoring by DOE.

f Silver limit is daily max if column 8 is most stringent.

g When columns 7 or 8 result in a negative number, use results from columns 5 or 6, respectively.

h When columns 12, 13 or 14 result in a negative number, use results from columns 9, 10 or 11, respectively, as applicable.

* Domestic supply not included in river use so pick from columns 7, 8, 12 or 15.

** Water Quality criteria for stream use classifications other than Fish & Aquatic Life are based on the 30Q5 flow.

Appendix 3 Continued - Effluent characterization for Selenium

01147 Selenium, total [as Se] / Location 1 / Season 0 / Base

Limit Start Date	Limit End Date	Sample Type		
2/1/2012	12/31/2016	COMPOS		
Limit				
Limit Unit Desc	Pounds per Day	Pounds per Day	Milligrams per Liter	Milligrams per Liter
Statistical Base	MO AVG	DAILY MX	MO AVG	DAILY MX
Limit Value	0.15	0.6	0.005	0.02
DMR Values	Q1	Q2	C1	C3
02/29/2012	NODI=B	NODI=B	NODI=B	NODI=B
03/31/2012	NODI=B	NODI=B	NODI=B	NODI=B
04/30/2012	NODI=B	NODI=B	NODI=B	NODI=B
05/31/2012	NODI=B	NODI=B	NODI=B	NODI=B
06/30/2012	0.0244	0.0244	0.0014	0.0014
07/31/2012	NODI=B	NODI=B	NODI=B	NODI=B
08/31/2012	0.0244	0.0244	0.0013	0.0013
09/30/2012	NODI=B	NODI=B	NODI=B	NODI=B
10/31/2012	NODI=B	NODI=B	NODI=B	NODI=B
11/30/2012	NODI=B	NODI=B	NODI=B	NODI=B
12/31/2012	NODI=B	NODI=B	NODI=B	NODI=B
01/31/2013	NODI=B	NODI=B	NODI=B	NODI=B
02/28/2013	0.0426	0.0426	0.0015	0.0015
03/31/2013	NODI=B	NODI=B	NODI=B	NODI=B
04/30/2013	NODI=B	NODI=B	NODI=B	NODI=B
05/31/2013	NODI=B	NODI=B	NODI=B	NODI=B
06/30/2013	NODI=B	NODI=B	NODI=B	NODI=B
07/31/2013	NODI=B	NODI=B	NODI=B	NODI=B
08/31/2013	NODI=B	NODI=B	NODI=B	NODI=B
09/30/2013	NODI=B	NODI=B	NODI=B	NODI=B
10/31/2013	NODI=B	NODI=B	NODI=B	NODI=B
11/30/2013	NODI=B	NODI=B	NODI=B	NODI=B
12/31/2013	0.08	0.08	0.0016	0.0016
01/31/2014	NODI=B	NODI=B	NODI=B	NODI=B
02/28/2014	NODI=B	NODI=B	NODI=B	NODI=B
03/31/2014	NODI=B	NODI=B	NODI=B	NODI=B
04/30/2014	NODI=B	NODI=B	NODI=B	NODI=B
05/31/2014	0.0232	0.0232	0.0011	0.0011
06/30/2014	NODI=B	NODI=B	NODI=B	NODI=B
07/31/2014	NODI=B	NODI=B	NODI=B	NODI=B
08/31/2014	NODI=B	NODI=B	NODI=B	NODI=B
09/30/2014	NODI=B	NODI=B	NODI=B	NODI=B
10/31/2014	NODI=B	NODI=B	NODI=B	NODI=B
11/30/2014	NODI=B	NODI=B	NODI=B	NODI=B
12/31/2014	NODI=B	NODI=B	NODI=B	NODI=B
01/31/2015	NODI=B	NODI=B	NODI=B	NODI=B
02/28/2015	NODI=B	NODI=B	NODI=B	NODI=B
03/31/2015	NODI=B	NODI=B	NODI=B	NODI=B
04/30/2015	NODI=B	NODI=B	NODI=B	NODI=B
05/31/2015	NODI=B	NODI=B	NODI=B	NODI=B
06/30/2015	NODI=B	NODI=B	NODI=B	NODI=B
07/31/2015	NODI=B	NODI=B	NODI=B	NODI=B
08/31/2015	NODI=B	NODI=B	NODI=B	NODI=B
09/30/2015	NODI=9	NODI=9	NODI=9	NODI=9
10/31/2015	NODI=B	NODI=B	NODI=B	NODI=B
11/30/2015	NODI=9	NODI=9	NODI=9	NODI=9
12/31/2015	NODI=B	NODI=B	NODI=B	NODI=B
01/31/2016	NODI=B	NODI=B	NODI=B	NODI=B
02/29/2016	NODI=B	NODI=B	NODI=B	NODI=B
03/31/2016	NODI=B	NODI=B	NODI=B	NODI=B
04/30/2016	NODI=B	NODI=B	NODI=B	NODI=B
05/31/2016	NODI=B	NODI=B	NODI=B	NODI=B
06/30/2016	NODI=B	NODI=B	NODI=B	NODI=B
07/31/2016	NODI=B	NODI=B	NODI=B	NODI=B
08/31/2016	NODI=B	NODI=B	NODI=B	NODI=B
09/30/2016	NODI=B	NODI=B	NODI=B	NODI=B

Appendix 3 Continued - Effluent characterization for Silver

01077 Silver, total [as Ag] / Location 1 / Season 0 / Base

Limit Start Date	Limit End Date	Sample Type		
2/1/2012	12/31/2016	COMPOS		
Limit				
Limit Unit Desc	Pounds per Day	Pounds per Day	Milligrams per Liter	Milligrams per Liter
Statistical Base	MO AVG	DAILY MX	MO AVG	DAILY MX
Limit Value	0.1	0.1	0.0033	0.0033
DMR Values	Q1	Q2	C1	C3
02/29/2012	NODI=B	NODI=B	NODI=B	NODI=B
03/31/2012	0.0436	0.0436	0.0028	0.0028
04/30/2012	NODI=B	NODI=B	NODI=B	NODI=B
05/31/2012	NODI=B	NODI=B	NODI=B	NODI=B
06/30/2012	NODI=B	NODI=B	NODI=B	NODI=B
07/31/2012	NODI=B	NODI=B	NODI=B	NODI=B
08/31/2012	NODI=B	NODI=B	NODI=B	NODI=B
09/30/2012	NODI=B	NODI=B	NODI=B	NODI=B
10/31/2012	NODI=B	NODI=B	NODI=B	NODI=B
11/30/2012	NODI=B	NODI=B	NODI=B	NODI=B
12/31/2012	NODI=B	NODI=B	NODI=B	NODI=B
01/31/2013	NODI=B	NODI=B	NODI=B	NODI=B
02/28/2013	NODI=B	NODI=B	NODI=B	NODI=B
03/31/2013	0.02043	0.02043	0.00055	0.00055
04/30/2013	NODI=B	NODI=B	NODI=B	NODI=B
05/31/2013	NODI=B	NODI=B	NODI=B	NODI=B
06/30/2013	NODI=B	NODI=B	NODI=B	NODI=B
07/31/2013	NODI=B	NODI=B	NODI=B	NODI=B
08/31/2013	NODI=B	NODI=B	NODI=B	NODI=B
09/30/2013	NODI=B	NODI=B	NODI=B	NODI=B
10/31/2013	NODI=B	NODI=B	NODI=B	NODI=B
11/30/2013	NODI=B	NODI=B	NODI=B	NODI=B
12/31/2013	NODI=B	NODI=B	NODI=B	NODI=B
01/31/2014	0.01105	0.01105	0.00069	0.00069
02/28/2014	NODI=B	NODI=B	NODI=B	NODI=B
03/31/2014	NODI=B	NODI=B	NODI=B	NODI=B
04/30/2014	NODI=B	NODI=B	NODI=B	NODI=B
05/31/2014	NODI=B	NODI=B	NODI=B	NODI=B
06/30/2014	NODI=B	NODI=B	NODI=B	NODI=B
07/31/2014	NODI=B	NODI=B	NODI=B	NODI=B
08/31/2014	NODI=B	NODI=B	NODI=B	NODI=B
09/30/2014	0.0348	0.0348	0.0023	0.0023
10/31/2014	NODI=B	NODI=B	NODI=B	NODI=B
11/30/2014	NODI=B	NODI=B	NODI=B	NODI=B
12/31/2014	NODI=B	NODI=B	NODI=B	NODI=B
01/31/2015	0.0355	0.0355	0.0018	0.0018
02/28/2015	NODI=B	NODI=B	NODI=B	NODI=B
03/31/2015	NODI=B	NODI=B	NODI=B	NODI=B
04/30/2015	NODI=B	NODI=B	NODI=B	NODI=B
05/31/2015	NODI=B	NODI=B	NODI=B	NODI=B
06/30/2015	NODI=B	NODI=B	NODI=B	NODI=B
07/31/2015	NODI=B	NODI=B	NODI=B	NODI=B
08/31/2015	NODI=B	NODI=B	NODI=B	NODI=B
09/30/2015	NODI=9	NODI=9	NODI=9	NODI=9
10/31/2015	NODI=B	NODI=B	NODI=B	NODI=B
11/30/2015	NODI=9	NODI=9	NODI=9	NODI=9
12/31/2015	NODI=B	NODI=B	NODI=B	NODI=B
01/31/2016	NODI=B	NODI=B	NODI=B	NODI=B
02/29/2016	NODI=B	NODI=B	NODI=B	NODI=B
03/31/2016	NODI=B	NODI=B	NODI=B	NODI=B
04/30/2016	NODI=B	NODI=B	NODI=B	NODI=B
05/31/2016	NODI=B	NODI=B	NODI=B	NODI=B
06/30/2016	NODI=B	NODI=B	NODI=B	NODI=B
07/31/2016	NODI=B	NODI=B	NODI=B	NODI=B
08/31/2016	NODI=B	NODI=B	NODI=B	NODI=B
09/30/2016	NODI=B	NODI=B	NODI=B	NODI=B

WQ Based Effluent Calculations- Other Compounds

PARAMETER	1	2	3	5	6	7	8	9	10	11	12	13	14	15	PARAMETER
	Stream Bgknd. Conc.	Detection Levels		Fish/Aqua. Life Water Quality Criteria		Calculated Effluent Concentration		Human Health Water Quality Criteria (30Q5)						Avg. daily effluent	
		Scan	WQC RDL	Chronic	Acute	Chronic	Acute	In-Stream Criteria			Calculated Effluent Concentration				
								Organisms	Water/Org	DWS	Organisms	Water/Org	DWS		
	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	[ug/l]	
ANTIMONY	0.0	3.8	3.0					640.0	5.6	6.0	640.0	5.6	6.0	<20	ANTIMONY
ARSENIC	0.0	1.0	1.0	150.0	340.0	150.0	340.0	10.0	10.0	10.0	10.0	10.0	10.0	<20	ARSENIC
BERYLLIUM	0.0	2.0	1.0							4.0			4.0	<2	BERYLLIUM
SELENIUM	0.0	5.0	2.0	5.0	20.0	5.0	20.0			50.0			50.0	<20	SELENIUM
THALLIUM	0.0	5.0	*					0.47	0.24	2.0	0.5	0.2	2.0	<20	THALLIUM
ACROLEIN	0.0	50.0	1.0					290.0	190.0		290.0	190.0		<50	ACROLEIN
ACRYLONITRILE	0.0	50.0	1.0					2.5	0.51		2.5	0.5		<10	ACRYLONITRILE
BENZENE	0.0	1.0	1.0					510.0	22.0	5.0	510.0	22.0	5.0	<1	BENZENE
BROMOFORM	0.0	1.0	1.0					1400.0	43.0		1400.0	43.0		<1	BROMOFORM
CARBON TETRACHLORIDE	0.0	1.0	1.0					16.0	2.3	5.0	16.0	2.3	5.0	<1	CARBON TETRACHLORIDE
CHLOROBENZENE	0.0	1.0	*					1600.0	130.0		1600.0	130.0		<1	CHLOROBENZENE
CHLORODIBROMO-METHANE	0.0	1.0	*					130.0	4.0		130.0	4.0		<1	CHLORODIBROMO-METHANE
CHLOROETHANE	0.0	1.0	*											<5	CHLOROETHANE
2-CHLORO-ETHYL VINYL ETHER	0.0	1.0	*											<50	2-CHLORO-ETHYL VINYL ETHER
CHLOROFORM	0.0	5.0	0.5					4700.0	57.0		4700.0	57.0		8.1	CHLOROFORM
DICHLOROBROMO-METHANE	0.0	1.0	1.0					170.0	5.5		170.0	5.5		2.8	DICHLOROBROMO-METHANE
1,1-DICHLOROETHANE	0.0	1.0	1.0					NA	NA	NA	NA	NA	NA	<1	1,1-DICHLOROETHANE
1,2-DICHLOROETHANE	0.0	1.0	1.0					370.0	3.8	5.0	370.0	3.8	5.0	<1	1,2-DICHLOROETHANE
TRANS 1,2-DICHLORO-ETHYLENE	0.0	1.0	*					10000	140.0	100.0	10000.0	140.0	100.0	<1	TRANS 1,2-DICHLORO-ETHYLENE
1,1-DICHLOROETHYLENE	0.0	1.0	1.0											<1	1,1-DICHLOROETHYLENE
1,2-DICHLOROPROPANE	0.0	1.0	*					150.0	5.0	5.0	150.0	5.0	5.0	<1	1,2-DICHLOROPROPANE
1,3-DICHLORO-PROPYLENE	0.0	1.0	1.0					210.0	3.4		210.0	3.4		<1	1,3-DICHLORO-PROPYLENE
ETHYLBENZENE	0.0	1.0	1.0					2100	530.0	700.0	2100.0	530.0	700.0	<1	ETHYLBENZENE
METHYL BROMIDE	0.0	1.0	*					1500.0	47.0		1500.0	47.0		<1	METHYL BROMIDE
METHYL CHLORIDE	0.0	1.0	1.0											<5	METHYL CHLORIDE
METHYLENE CHLORIDE	0.0	5.0	1.0					5900.0	46.0		5900.0	46.0		<5	METHYLENE CHLORIDE
1,1,2,2-TETRACHLORO-ETHANE	0.0	1.0	0.5					40.0	1.7		40.0	1.7		<1	1,1,2,2-TETRACHLORO-ETHANE
TETRACHLORO-ETHYLENE	0.0	1.0	0.5					33.0	6.9	5.0	33.0	6.9	5.0	<1	TETRACHLORO-ETHYLENE
TOLUENE	0.0	1.0	1.0					15000	1300.0	1000.0	15000.0	1300.0	1000.0	<5	TOLUENE
1,1,1-TRICHLOROETHANE	0.0	1.0	1.0							200.0			200.0	<1	1,1,1-TRIC

a. Columns 7-8, and 12-14 are the effluent concentrations allowable to prevent exceedance of water quality criteria.

b. Potential to exceed criteria exists if the measured quantity in column 15 exceeds, or could exceed, the calculated allowable concentrations in columns 7-8, and 12-14.

c. Additional testing is required if the detection level used in the scan is higher than the state RDL and/or the MDL of the approved EPA scan method and industry is known to have that pollutant.

d. All background concentrations for these volatile organic, acid-extractable, and base-neutral compounds are assumed zero in the absence of supporting monitoring data.

e. Other metals for which data were provided on the application are evaluated on the Metals & Toxics spreadsheet.

f. Reasonable potential does not exist for the following reason(s):

The required MDL has been used and resulted in non-detection (BDL) or the contributing industrial processes are NOT likely to contain them.

APPENDIX 5

Effluent Conductivity Monitoring Results (for Habitat Conservation Plan)

00094 Conductivity / Location 1 / Season 0 / Base

Limit Start Date	Limit End Date	Sample Type	
2/1/2012	12/31/2016	COMPOS	

Limit		
Limit Unit Desc	micromhos per c	micromhos per centimeter
Statistical Base	MO AVG	DAILY MX
Limit Value		
DMR Values	C1	C3
02/29/2012	475	530
03/31/2012	417	440
04/30/2012	527	551
05/31/2012	521	608
06/30/2012	588	629
07/31/2012	543	640
08/31/2012	610	628
09/30/2012	587	617
10/31/2012	560	571
11/30/2012	582	629
12/31/2012	508	596
01/31/2013	432	470
02/28/2013	463	508
03/31/2013	452	465
04/30/2013	432	467
05/31/2013	405	454
06/30/2013	548	615
07/31/2013	472	559
08/31/2013	542	603
09/30/2013	561	595
10/31/2013	566	581
11/30/2013	577	618
12/31/2013	328	428
01/31/2014	491	546
02/28/2014	504	550
03/31/2014	442	486
04/30/2014	425	483
05/31/2014	489	515
06/30/2014	522	578
07/31/2014	519	536
08/31/2014	554	639
09/30/2014	575	589
10/31/2014	498	543
11/30/2014	485	515
12/31/2014	420	485
01/31/2015	419	467
02/28/2015	492	529
03/31/2015	559	596
04/30/2015	416	495
05/31/2015	550	587
06/30/2015	584	615
07/31/2015	453	527
08/31/2015	557	657
09/30/2015	608	659
10/31/2015	581	650
11/30/2015	538	601
12/31/2015	376	445
01/31/2016	456	514
02/29/2016	420	603
03/31/2016	630	655
04/30/2016	592	645
05/31/2016	547	758
06/30/2016	443	640
07/31/2016	399	506
08/31/2016	570	750
09/30/2016	752	810

AVERAGE 510 571